

# American Artisan

THE WARM AIR HEATING  
AND SHEET METAL JOURNAL  
FOUNDED 1880



Your display floor serves two purposes—first, it shows what you have to sell and, second, it provides a place where you can sell undisturbed and with everything at hand to demonstrate. This is the display floor and office of a Toledo Contractor. Information on his floor is in this issue. Look in the Merchandising Section

MARCH 2, 1931



# GEAR

## YOUR BUSINESS TO THESE TWO GROWING MARKETS FOR WARM-AIR HEATING

**T**WO great markets—larger installations—a more profitable business are now placed within your grasp. Gear your business to 1931 heating requirements with modern “AFCO” equipment.

New design—new construction features—new standards of heating efficiency identify “AFCO” furnaces and complete units as the leaders in value and performance.

Measure by any comparison you may care to make and you will find “AFCO” offers an unparalleled opportunity to build a more profitable business—particularly now when the warm-air heating industry is on the verge of its greatest development.

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*“Other Furnaces  
Come and Go —  
AFCO Stays and  
Grows”*

### AMERICAN FURNACE COMPANY

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St. Louis, Mo.

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Thermo Cast Iron Furnaces    “AFCO” Boiler Plate Furnaces

“AFCO DeLuxe” Domestic Healthful Heating Systems

“AFCO DuoBlo” Industrial Heaters

March 2

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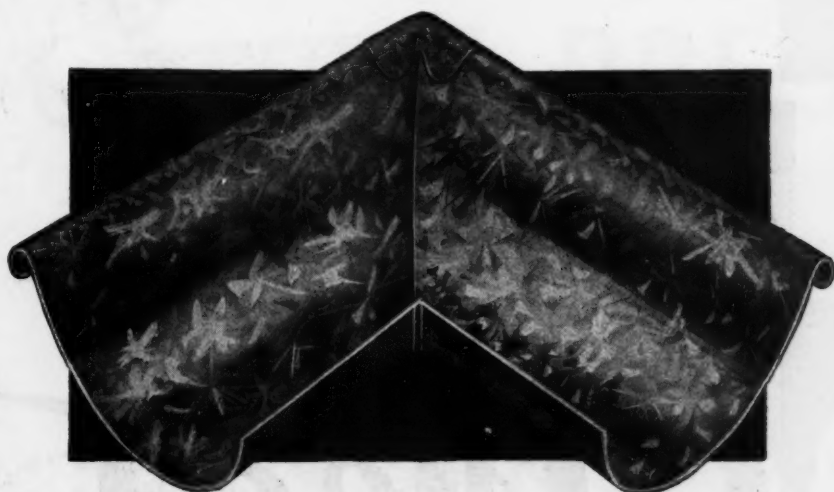
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INDEX P



IND





The BARNES Super-Miter.  
Uncomparably Rigid

**Full of Merit  
That is why  
*Barnes*  
Dominates**



BARNES—that specially strength constructed Eaves Trough with the square, firm edge, meets all non-sagging test requirements.

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with Lock-Tite End Cap



**BARNES METAL PRODUCTS COMPANY**

4425 West 16th Street CHICAGO, ILLINOIS

Manufacturers of Conductor Pipe, Elbows, Eaves  
Trough and Fittings. - All Sizes - All Metals

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[VOL. 100, NO. 5—\$2.00 PER YEAR]

BUYERS' DIRECTORY—52 and 54

# MERGING 2 Great NAMES

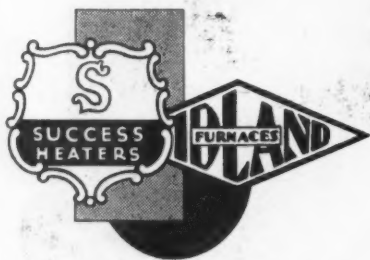
WITH the acquiring of the SUCCESS HEATER MANUFACTURING COMPANY of Des Moines, Iowa, two great names have been linked, and the MIDLAND FURNACE COMPANY offers the furnace industry a QUALITY STEEL GROUP heretofore unobtainable and being manufactured under one roof.

Today, it's *Centralization*, allowing mass production of quality merchandise under experienced and capable supervision.

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Sell the QUALITY STEEL GROUP.

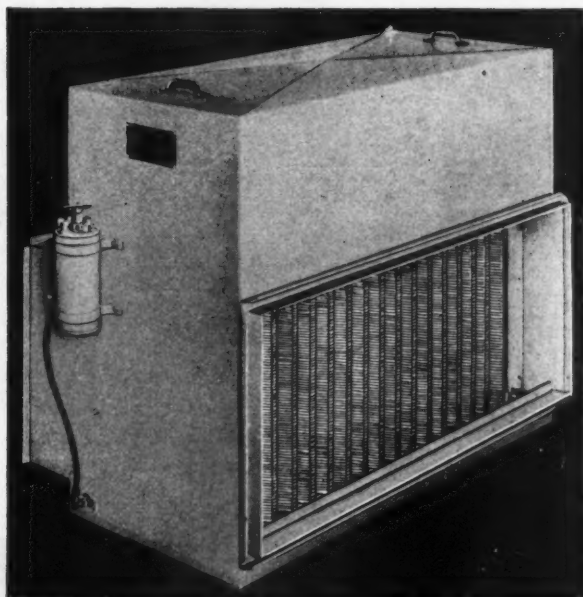


MIDLAND FURNACE COMPANY  
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# **SILENTAIR PRESENTS**

## **THE SILENTAIR AIR FILTER**



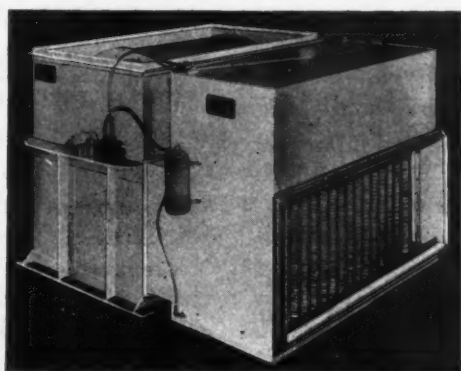
### *A Noteworthy Addition To An Illustrious Line*

The SILENTAIR blower type fan and SILENTAIR air washer unit had to possess unusual merits to attain such national distribution in so short a time after the first announcement. Their superior qualities are too well known to require further comment.

We now announce the SILENTAIR air filter, a noteworthy addition to this illustrious line of air conditioning units. Used in tandem with a SILENTAIR fan, it produces splendid results. Used in connection with both the

fan and the washer, it is a positive guarantee of the ultimate in air conditioning.

The SILENTAIR air filter removes from the air, after passing through the fan, all foreign substances, and delivers to the various rooms of the home, air in its natural and pure state.



(SILENTAIR Fan and Filter in tandem)

SILENTAIR air conditioning units completely solve any air conditioning problem. Detailed specifications of this latest addition to the SILENTAIR line will be furnished upon request.

### **SILENTAIR AIR CONDITIONING UNITS**

Manufactured by

# **A. GEHRI & CO.**

Tacoma, Washington

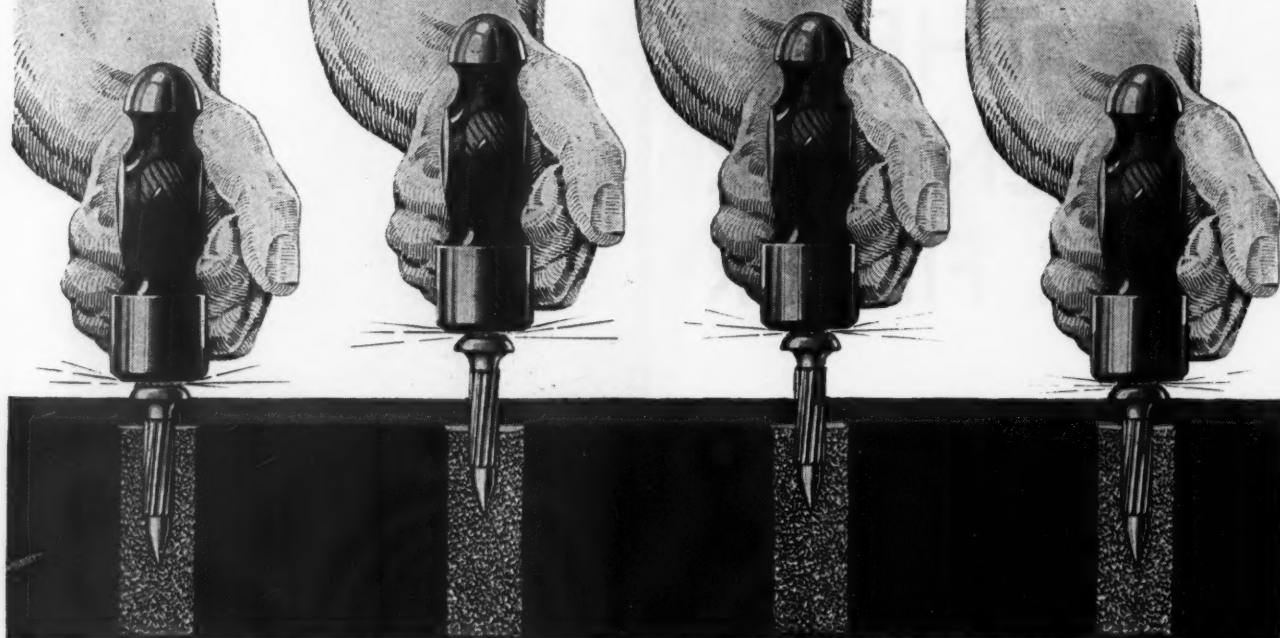
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*when fastenings are made with Masonry Nails*



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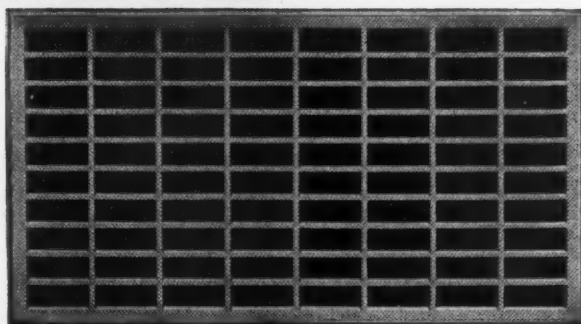
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# The STANDARD OF COMPARISON SUPER-REGS

STYLE "C"  
COBBLE COLD  
AIR FACE

All cast iron and  
100% efficient



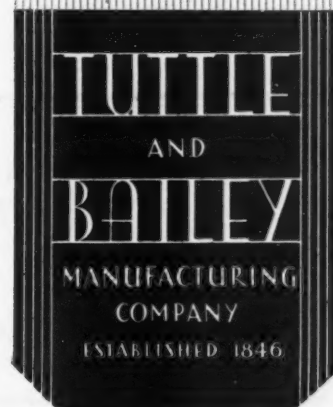
There must be some reason why "Super-Regs" have been copied so much. But the most clever imitation of design, color or even mechanical features cannot replace the underlying unvarying quality that has made Super-Regs the standard of comparison.

Baseboard registers (one or two pieces)—Side Wall registers—Floor type registers—"Cobble" Cold Air Faces . . . each has its identifying name, but all are "Super-Regs" . . . finished in many standard colors and neutral tones or in the famous exclusive T. & B. "Tanbo" finish, for harmony with interior decorative plans. All are made to satisfy the same unyielding standards of design, construction and workmanship—every one a testimonial to the leadership of Tuttle & Bailey in the industry since 1846.

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Founded 1880

# American Artisan

THE WARM AIR HEATING  
AND SHEET METAL JOURNALCovering All Activities  
INGravity Warm Air Heating  
Forced Warm Air Heating  
Sheet Metal Contracting  
Air Conditioning  
Industrial Roofing  
Merchandising  
Ventilating

If you are feeling down in the mouth over poor business, take a few minutes off and read the leading article in this issue. It is the story of a replacement sale made from a call to inspect a furnace which had been ordered cleaned. The cleaning would have cost \$4.00, but the home owner saved this expense by buying a new heating system for \$700. That's merchandising economy!

\* \* \*

There is a nice problem on estimating in this issue. It is an actual job which was figured and sold at a profit. The idea of this story is to give you readers a chance to tell us how you estimate. B. F. John, with the editor, will then analyze your costs and tell where you went wrong—that is, providing you do go wrong.

\* \* \*

And let us again call your attention to the two series—one by Platte Overton and the other a new series by G. A. Voorhees. There's real meat in these articles and if you want to really know heating, begin the series now and follow them through.

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MARCH 2, 1931

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JOSEPH D. WILDER  
Editor

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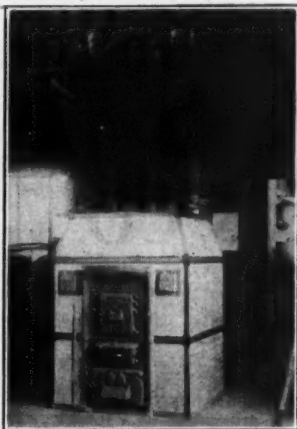
Premier DeLuxe, the cast Premier, is shown at the right with a new Premier Square Casing. Note the well balanced proportions, the neatness and the scarcity of bolt and screw heads.

# The SQUARE CASING

## AS PREMIER BUILDS IT



ABOVE: The New 1931 Premier Duo-WELD with a new Premier Square Casing. BELOW: Seven men standing on top of a New Premier Square Casing to demonstrate its strength. Total weight of men, 1,123 pounds. The casing would have supported just as many more men as could have gotten on.



There's no use wasting any words about its good looks. Its appearance above speaks for itself. So let's get down to brass tacks about how it is built and what it will do. First of all, it's strong—strong as the Rock of Gibraltar. The photograph below proves that. Next, it's dust-tight. *In fact, it is water-tight!* WE TRIED IT! Another thing, one man can set it up quicker than we can tell about it. That's because of its patented slip joint construction. Still another advantage is that it is shipped flat knocked-down. No chance of it becoming mashed out of shape in transit. Last, and most important, it is Premier built! You will be interested in the folder that gives complete details of the New Premier Square Casing. Ask for it and it will be sent you through the mails. No obligation—no personal call.

# PREMIER

## WARM AIR HEATER CO.

Dowagiac, Mich.

**IMPORTANT NOTE:** Unlike many other square casings, an inner casing liner is standard equipment on Premier Square Casings. The inner casing liner is rounded in the corners to avoid dead circulation.

Mention *AMERICAN ARTISAN* in your reply—Thank you!





# And NOW---

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3. Absolutely gas tight. Welded into one solid unit from fire box to dome.
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5. Can be operated either with manual or all automatic control.
6. The Western GAS Furnace is sold singly or in units of 2, 3 or 4 in a battery. A single unit will heat the average seven or eight room residence.
7. Can be furnished to burn either manufactured or natural gas.
8. A stock of Western GAS Furnaces will be carried at Kansas City, Mo., for shipment in all southern or southwest states.

*Write for Catalog*

*The Western coal burning furnace will continue to meet the large demand for quality warm air furnaces. The reputation gained by this sturdy product of the north will lend a hand to its newest relative and at the same time boost your sales where gas is not desired.*



### WESTERN STEEL PRODUCTS CO.

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*For Southern Distribution*

### WESTERN STEEL PRODUCTS CO.

521 WESTPORT AVENUE  
KANSAS CITY, MISSOURI

*Mention AMERICAN ARTISAN in your reply—Thank you!*



## Let's Pound the Architect in 1931

**W**E'VE heard and read a lot so far this year that 1931 is going to be a good year—for those contractors who can and *will* get out and sell.

But in most of this discussion one important prospect has been somewhat slighted.

That prospect is the *architect*.

Where and how does the architect fit into the picture?

There is no denying that the average architect is a somewhat funny bird. His training has been much to the artistic. He visualizes things in terms of what they will look like before he studies what they will do. In many cases he is self centered and hard to talk to, especially for a sheet metal or furnace man because, to be frank, he thinks we are somewhat beneath his notice.

Nevertheless he *can* be sold!

In order to analyze the situation let's stop for a moment and consider what the architect is and what he does. First off, he designs practically all the large buildings where sheet metal is used for ornamentation, sheathing or ventilation. He it is, too, who is planning large homes where the owner has the money to buy and the inclination to have the best and most modern in heating equipment.

Regardless of what sort of coordination you now have with one or more architects, it is probable that your relations in the future are going to be more intimate.

Probably your local architect would like to use metal if he was sure that some metal contractor could fabricate the designs he works out. He accepts or rejects metal principally on the basis of finding a contractor who can follow his ideas and deliver a sound job.

Many contractors and local organizations have started the ball rolling by presenting architects with copies of Standard Practice in Sheet Metal Work. But the presentation of the book is not the end of the problem. The contractor must follow up all jobs which he hears about and inquire if the architect is going to use metal. The contractor should be equipped to advise the architect how and where metal can be

used and be prepared to show drawings and explain metal's qualifications.

Of course this means steady contact with the architect. But steady contact with the architect can be just as profitable as a whole lot of the solicitation now carried on.

The same situation exists in the field of house heating. Here the architect is being asked for information on humidified air, on circulated air, and on the kind of air conditioning now provided in theaters and public buildings.

In most instances the architect's information is little more than a snattering of knowledge. He hasn't had time to look into air conditioning as you have—nor is he as vitally interested. If he can get by by specifying a hot water or steam job, on which he has to spend but a fraction of time and thought—then he is going to specify that type of heat.

This inertia can be overcome only by steady contact. Every large house built is a logical prospect for the very type of heat we can give. No one can say, either, that the architect won't recommend a new and modern type of air conditioning if he feels sure of his ground and has someone to back him up when it comes to presenting the qualifications.

That's right up the alley of the warm air heating contractor.

It should be every heating contractor's routine work to call on every architect he can and give him the latest information about air conditioning. Every job which is installed should be used as a display floor to which architects should be taken to study and see.

At the same time architects should be shown pictures and articles giving details of the latest air conditioning systems. He can't help but be interested and become enthusiastic once the bug of air conditioning is planted in his system.

But the thing to remember is that as our sheet metal and warm air heating business advances to higher levels we are going to have to take the architect along with us.

In this case we are going to be the leaders and the architect the follower.

Why not lead him our way instead of following him?



▲  
This is the square cased furnace. All warm air is taken off through one duct. The small blower is a forced draft fan permitting use of slack coal. All the equipment is automatically controlled.  
▼

## Rummel Called to Inspect a \$4.00 Cleaning Job, and—

One day last fall, Mr. Rummel got a call to come out and clean a furnace. One of the operating principles of this progressive heating contractor is that every cleaning job must be inspected personally before the job is started.

The reason for this inspection is that Mr. Rummel has found that in a large number of instances he can sell replacement parts, add a return air here, put in a new warm air register and piping there and in a surprising number of instances sell a complete new furnace.

So when this cleaning call came in, Mr. Rummel called to look over the job. He found that the heating was unsatisfactory in several of the rooms, that the installation was excessively dusty, that the cost of operation was just about twice as high as it need be for the size of the house and most important of all that the owner could be interested

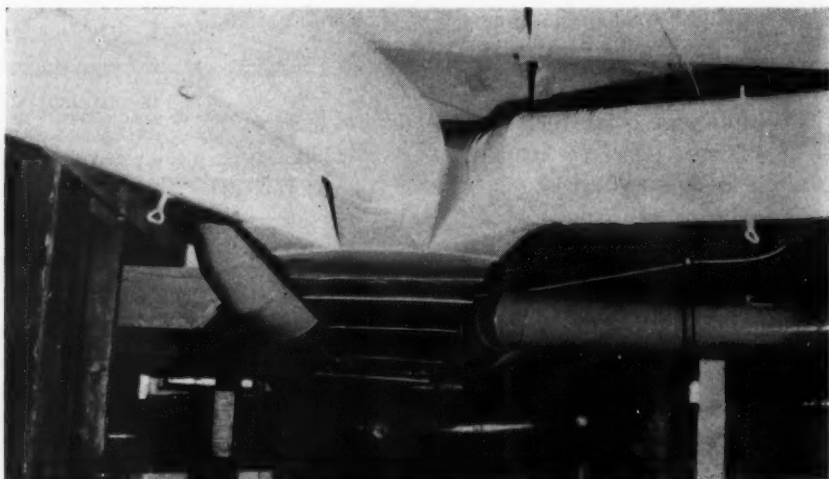
**S**ELLING a \$700 replacement and alteration installation as a result of a \$4.00 cleaning call is exactly what every warm air heating contractor dreams takes place every day in heaven.

That such a sale can be made has been proved by contractors in all parts of the country but is not yet believed by all.

Just by way of definite proof that this sort of a sale is possible, let us tell you about a replacement job which did sell for \$700 and which was sold as a direct result of a call to look over a cleaning call quoted at \$4.00.

The contractor who made this sale is W. A. Rummel of South Bend, Indiana. Mr. Rummel oper-

ates under the name of Rummel, Inc., and does heating work exclusively.



The end of one of the trunks. Note the use of square to round transitions and dampers in every branch. Most of these run wide open

Where the main trunk makes its first split. The rectangular ducts are carried out just as far as job conditions permitted. The large round pipe at the right is one of the return airs



## Sold the Owner a \$700 Replacement With All Accessories

in modern warm air heating.

A new heating plan was designed, the changes required were outlined on a prepared and typewritten set

of specifications and the job was sold.

Here is what Mr. Rummel sold the home owner—

One new steel furnace enclosed in a square casing.

A trunk line system for the ducts.

A forced air installation using pressure fans.

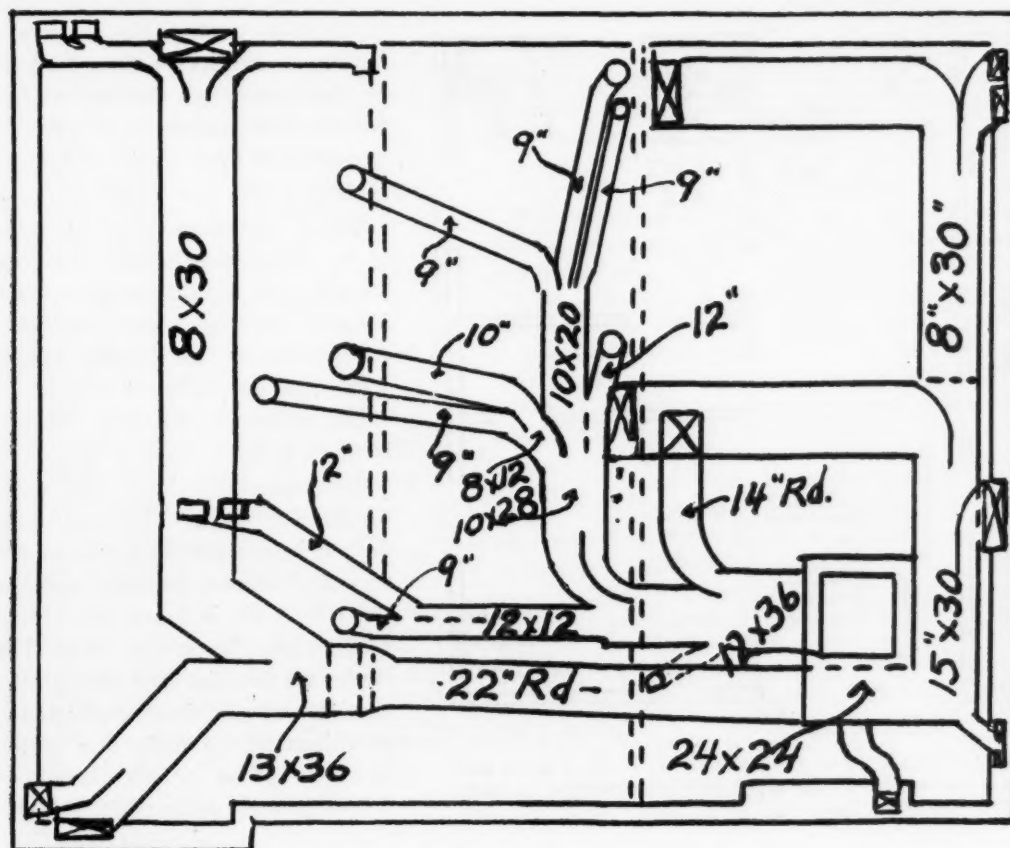
Full automatic control for the house and the fans.

A special forced draft blower to permit burning fine coal.

A complete paint job for the furnace and the ducts.

A warm air register and a return air lead out of every room in the house.

An automatic draft adjuster.



This is the layout of the heating system. One of the important sales arguments was that with forced air the furnace could be placed clear back in a corner. Note the use of deflectors at every branch and at the paired return air branches



A set of dry filters to clean the air.

The heater is placed in an unusual corner of the basement.

The selling price—\$700.00.

Before we point out some of the interesting design and construction features of the installation, let us tell you a little of the owner's attitude toward the new plant after several weeks of operation.

First, the cost of operation has been reduced materially. Whereas the previous system consumed \$200 worth of fuel a season the new installation is estimated to end the winter at a cost of not more than \$60. Of course this winter has been mild, but there will be a saving of at least 50 per cent.

The heating of the house has made the owner an enthusiastic booster of warm air, where before he was somewhat disgusted. With warm air forced into every room, and every room provided for returning the air to the fans, a complete circulation of air is assured all the time.

Where before the operation of the furnace accounted for quite a bit of the housewife's time in firing and operating drafts and checks,



Another view of the trunk line. The large rectangular duct at the left is return air as is the large round pipe in the background

now the plant operates automatically and requires fueling usually once a day and in bitter weather twice a day.

The air now is so clean that the house is dustless, where in the old plant dust was always working up into the rooms.

Now for a few of the most interesting details of the design.

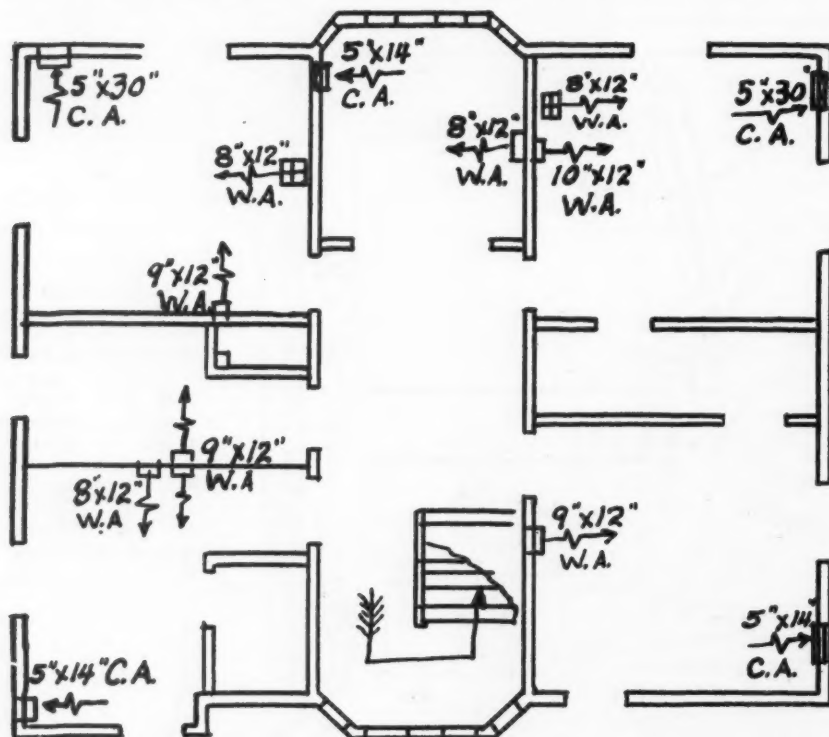
Shown with this article are the plans for the basement system, and the first and second floor. Let us call your attention first to the basement. One of the things which

caused dissatisfaction with the old plant was the location of the furnace. In the alteration work the furnace was placed just as far back in one corner as possible. It is located right next to the chimney and all warm air is trunked from the heater and the return air brought back through rectangular ducts hung up against the joists where necessary, but placed between the joists when possible.

It is interesting to note that the warm side of the system is fairly compact. At the furnace all the air is brought out through one large rectangular duct. This is broken into two main lines a short distance off the bonnet and then reduced to individual branches. Each branch is controlled by a quadrant damper to balance the heat supply.

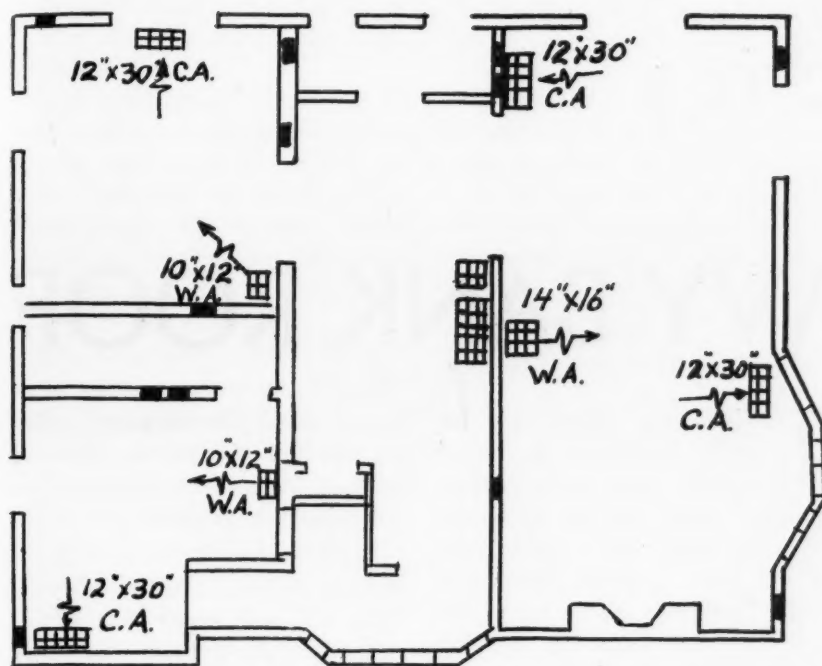
These branches are, in most cases, round pipe, first to reduce the cost and second because of the layout of the basement, round pipe proved easier to handle across joists and supporting beams.

The return air side of the system is much longer. As can be seen it follows generally the outside walls of the basement. This was done first to keep these ducts out of the way and second because most of the return air is taken out of the rooms along the outside walls. The stacks are then dropped through the outside walls or down through the partitions to the main line in the basement. One of the details of this return air system is the doubl-



This is the layout of the second floor. The old registers were left in place and used and a second register was placed in the three bedrooms hardest to heat. Every room has return air





This is the layout of the first floor. Every room has ample return air provision, placed along outside walls. Inlets are on inside walls to shorten the run of warm air to the registers.

ing up of the stacks and leads to first floor grilles. Wherever possible the branches were brought in in pairs or as nearly paired as possible. This reduced the number of transition fittings necessary along the ducts and simplified erection work.

Another detail is the use of the large 22-inch round pipe which drops the return air from one of the ducts to the fan housing. The round pipe was used because that part of the basement lies along a stairway which is useless anyway, and the round pipe could be sloped into the fan housing.

Attention should be called to the fact that in three of the bedrooms there are two warm air inlets. The old inlet was used and connected into the new trunk system, but in addition a second inlet with new stacking was installed. This was done to insure plenty of warm air in rooms which previously had proved impossible to heat.

Where the ducts were run between joists the bottom of the joists were closed with iron, but the under side of the floor and the sides of the joists inside the duct were lined with cork board to keep out the dust. This also eliminates noise and vibration.

The ducts were laid out on the job, but all forming was done in the shop. The sections were made up in lengths as long as permitted by the brake and job conditions and erected as complete ducts. Each section is joined to the next by a turned lock which puts  $\frac{1}{4}$  inch of metal standing in a seam across the duct for reinforcing. On the round pipes all the joints were wrapped with asbestos paper.

The furnace used is a No. 630 Weir in a special square casing. The furnace has a capacity of 119,000 B.t.u., or considerably above the requirements of the house which has eight rooms and bath.

It probably is of interest to point out how Mr. Rummel designs the duct sizes. All the ducts are designed according to the Standard

(Continued on page 32)

### SPECIFICATIONS FOR HEATING AND VENTILATING

We propose to make the following changes in registers on the second floor for gravity installation:

Install additional registers in each bedroom with complete run to basement, except in south bedroom.

First floor register in living-room to 16-inch pipe capacity.

In large hall to 14-inch pipe capacity.

In large dining-room and kitchen to 12-inch capacity.

#### Cold Air Specifications

Install cold air registers in each room on the second floor and extend to the basement.

Install cold air in hallway; capacity, 300 inches.

Connect to other cold air registers now in.

#### Basement

We propose to set the furnace in the south corner of the basement in front of chimney. Heat to leave furnace in trunk line below joists and branch off to special register connection.

Cold air to be carried below joists in box formation and enter at the top of furnace in a square cold air jacket.

The entire heating plant in the basement painted in choice of color.

Opening now in cement floor to be filled up and cemented over.

The entire bottom of furnace to have a specially constructed water basin installed to clean the air and give proper humidity at all times.

#### Forced Air Specifications

Installation to be made the same as gravity, with the exception that all registers on the first floor to remain as they now are, except the living-room register to be enlarged to 14 inches, and a special blower to be installed with the furnace inside of the cold air jacket.

The installation with forced air is unconditionally guaranteed to heat each and every room in the house in all kinds of weather, provide humidity and be absolutely clean.

This is subject to the condition that a proper heat is maintained in the furnace.

This is a typical Rummel specification. This one was given the owner of the job told about here

# COPPER, CORK AND WALKING TILE FEATURE THIS

## HEAVY BANK ROOF

**Owners of high class buildings are steadily turning to the large sheet metal and roofing contractor for the erection of permanent, expensive roofs. These owners demand contractor responsibility and ability and our contractors fill this need. Here is a typical such roofing job**

**T**HERE was opened late last year in Toledo, Ohio, one of the finest and most modern bank and office buildings of northern Ohio. This building, the home of the Ohio Savings Bank and Trust Company, stands on a site which for many years was occupied by the old Boody Hotel, one of Ohio's landmarks.

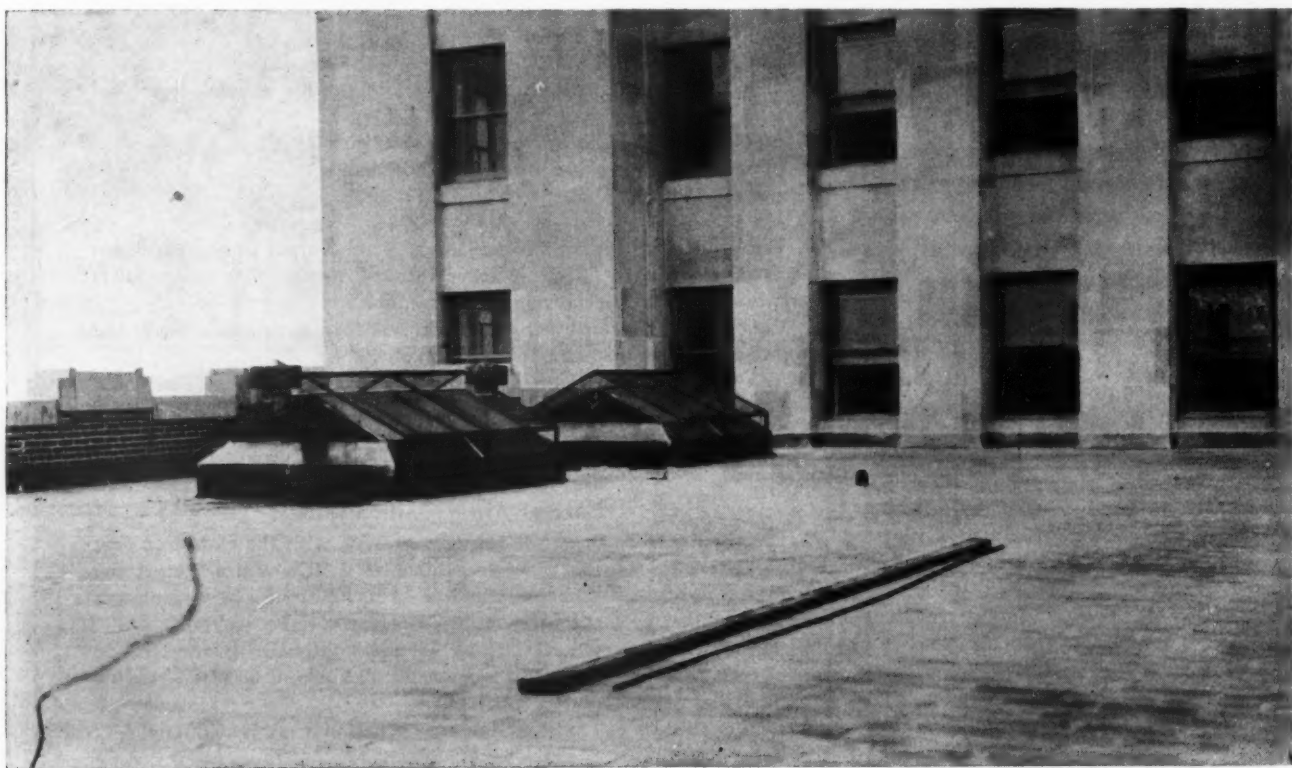
The new building was built to be as permanent a structure as any in Ohio and to make it so only the very best of materials and workmanship were contracted for.

Typical of this attitude is the stone facing which covers all four sides, a practice which is often

pushed aside for economy's sake, but which in this case was followed in order to make the building as fine a building as possible.

While many of the contractors working on the building held contracts for more money than is represented by the contract secured by the Warnke Brothers Company of Toledo, roofing, sheet metal and ventilating contractors, this firm's contract covered some interesting details of design and construction.

In the Warnke contract there is included complete ventilation and air conditioning from the fifth floor down, there is walking tile roofs on all the setbacks and thousands of



The heavy paper and cork roof is covered by 1/4-inch walking tile on this largest setback roof. The heaviest traffic can be carried without fear of damage

pounds of copper and galvanized iron in the ventilating system and flashings.

The building is 30 stories in height, including the service stories in the tower section. There are three basements, the first basement being utilized for banking departments, and the second and third basements for the operating departments of the building.

The structure is designed with setbacks occurring at the 5th, 8th, 18th, 22nd and 25th floors. These setbacks are entirely a matter of architectural design, serving to make the building distinctive to Toledo. They are not required by the zoning laws of the city, but have proved to be valuable in giving the structure a modern, metropolitan appearance.

One of the largest items in the contract was the roofing work on the setbacks and the tower roof. The five setbacks range in area from two very large ones to three smaller ones higher up the building.

The construction on all these setbacks is identical. The steel framework supports a flat slab concrete roof, reinforced to carry loads. The roof over this slab is both heavy and also insulated.

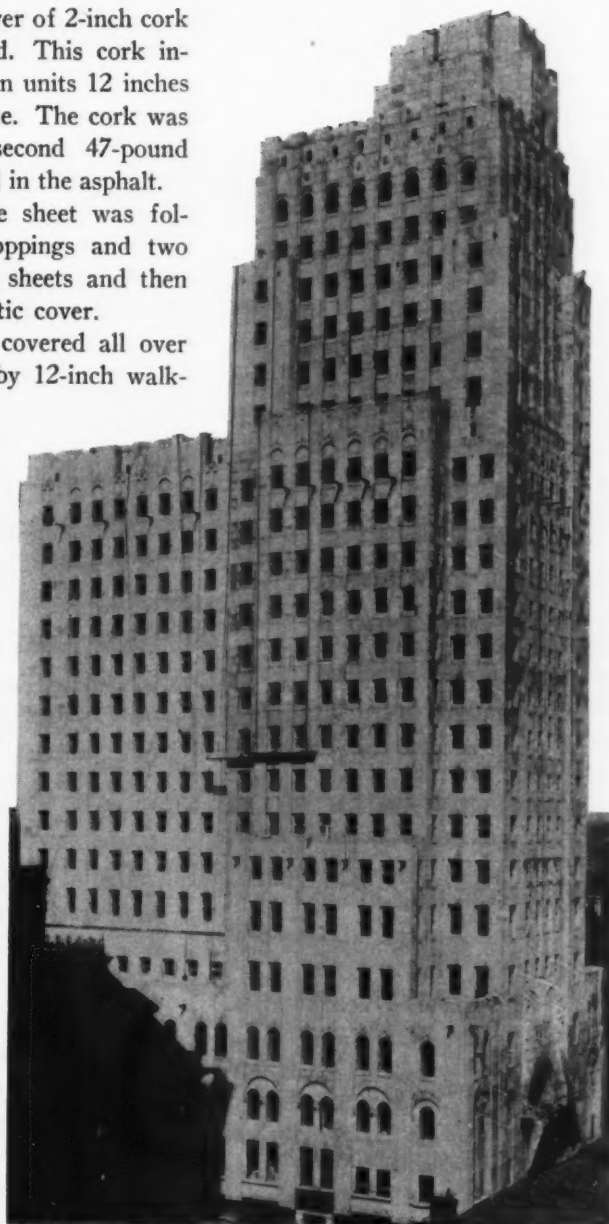
The concrete was given a heavy mopping with asphalt and in this mopping a 47-pound base sheet was laid. This was given a mopping and

in the asphalt a layer of 2-inch cork insulation was laid. This cork insulation was laid in units 12 inches by 36 inches in size. The cork was mopped and a second 47-pound base sheet was laid in the asphalt.

This heavy base sheet was followed by two moppings and two 15-pound asbestos sheets and then finally with a mastic cover.

This roofing is covered all over the decks with 6 by 12-inch walk-

This is the exterior of the handsome building. The setbacks, which are covered with the heavy roofs told about, are evident. The entire building was designed and planned to be as permanent as possible



More than 2,000 feet of 9-inch double copper flashing was used in the roofs. The cap was brought down to the top of the tile and plugged and cemented into the wall



ing slate,  $\frac{1}{4}$ -inch thick, laid without lap, but with a cement grout for binder. One of the pictures taken on the setback shows the appearance of this tile roof. This type of construction provides a permanent roof which is immune to traffic impact, and which is also insulated against weather and heavy enough to last indefinitely.

This heavy roof construction is duplicated in the careful flashing work which was insisted upon. All the setbacks are flashed with 16-ounce copper with the flashing strips cut 9 inches wide uniformly for all the setbacks.

In this job some 2,000 feet of this copper flashing was used.

As can be seen on one of the photographs this flashing is unusually wide in the cap. The base flashing is carried up to the top of the cap flashing and the cap flashing, in turn, is brought out of the brick wall and down to the top of the tile roof. The same construction is used wherever skylights and ventilators are brought up through the roof.

Scattered over the various setbacks are several copper skylights. These were all laid out and fabricated in the Warnke shop. The ventilator end type was used to furnish both ventilation and light. Each of the skylight glass tops is



This roofing material display stands adjacent to the Warnke shop and office. Various materials and laying methods are illustrated

protected by a heavy copper screen whenever the skylight is placed at all close to the building.

In addition, there are a number of straight copper ventilators used on some of the decks.

The bank floors, from the fifth floor down, are completely air-conditioned and mechanically ventilated. The air-conditioning installation is a specially designed system using Buffalo Forge and Clarage Fan Company equipment, and a

190-ton Brunswick-Kroschell ice machine. National Regulator Company control equipment is used in regulating the temperatures in this portion of the building.

The contractor used some 160,000 pounds of galvanized iron in the duct work of this system. The entire system is carried up to a point above the 22nd floor where the air is exhausted. This meant running large vertical ducts from the sixth floor to above the 22nd.

In addition to the ventilation system for the banking quarters, all the toilet rooms from the sixth floor to the 23rd are ventilated through one centralized system. These also exhaust through the top of the building.

The Warnke Brothers Company do a great deal of roofing work. This phase of their activities covers both industrial roofing and house roofing. One of the photographs shows a roofing sign which stands outside the office building of the Warnke establishment. This large display board, built in the form of a roof, is covered with a number of the different kinds and colors of house roofing materials the company is prepared to supply and lay. The display also illustrates several styles of laying.



There are several of these large copper skylights and ventilators. The curb is flashed with copper



# SOME POINTERS ON

## Soldering Allegheny Metal

By **KENNETH T. MacGILL**

*Joseph T. Ryerson & Son, Inc.*

**A**LLEGHENY Metal can be soldered easily and well. Soldered joints have shown as high as 8,000 lbs. per square inch on tensile pull tests.

A knowledge of the physical properties of both Allegheny Metal and solder is a help in overcoming any difficulty met with in soldering this metal. Some of the properties which make Allegheny Metal so desirable to use, such as its resistance to chemical action and its low ratio of thermal conductivity (being only 48 per cent of iron) are directly opposed to the properties which make ordinary soldering easy.

The strength of a soldered joint is built up to a large extent by the fillet which should be formed on the back of the seam as well as the front where the soldering iron is in contact with the metal. To secure such full penetration it is, of course, necessary that the full width of the seam be heated to a point above the complete liquidation point of the solder.

Appreciating the slowness with which Allegheny Metal conducts heat, it is obvious that to solder, using ordinary grades of solder, either greater heat must be used on

the soldering iron, or the travel of the soldering iron slowed, so as to give sufficient time for the full width of the seam to attain the proper temperature.

Both of these methods are objectionable as they make the operator deviate from his usual practice, and unless he is unusually skilled the



Cross-section of an ideal soldered lap joint. The text gives a full explanation of the process needed to get such a joint

work is apt to be faulty. To overcome this a special Allegheny Metal Solder and an Allegheny Metal Dairy Solder have been developed. These not only have greater strength than the ordinary solder, but are completely liquid at lower temperatures. The temperatures used in ordinary soldering heat the entire width of the seam to a point where these new solders will penetrate the seam and form the necessary fillet on the reverse side.

In order to secure these results,

it is understood that the parts to be soldered are free from oxide and grease, otherwise the solder will not adhere. On account of the high resistance of Allegheny Metal to chemical corrosion, ordinary fluxes do not properly etch the surface, so a special flux has been developed which accomplishes this result. On account of the tendency of flux acid to attack Allegheny Metal it is necessary that the workman, when the job is completed, thoroughly wash all surfaces with a soapy or soda solution in order that the finish of the Allegheny Metal will not be spoiled.

Tests have shown that a soldered joint with 1/64 inch of solder between the surfaces has much greater strength than a job where the surfaces are only sweated together. It is evident that if the two surfaces to be soldered are tightly clamped together, neither the flux nor the solder can penetrate. Care should be taken if the two pieces must be clamped in order to hold them, that a thin spacer or a slight crimp is put in the metal at the point where the clamp is placed in order to insure sufficient space for both the flux and solder to penetrate.

◆◆◆

New metals, especially the bright metals, are rapidly becoming popular. Their uses are many—their properties are different from those of longer known metals. Every contractor should know how to handle these new metals. Here's authentic information on soldering them. File this for reference.

▲   ▲   ▲   ▲   ▲

# Some More Overhead

## I. F. Jennings, Welch, W. Va., Uses a Typical Job to Ask Why Overhead on Productive Labor Isn't Best. What Do You Think of This?

AMERICAN ARTISAN,  
139 North Clark Street,  
Chicago, Ill.

Gentlemen:—

I have just read Mr. Joseph G. Dingle's article in the November 22, 1930, issue of the *AMERICAN ARTISAN* on OVERHEAD, and how figured. I think his way of figuring is all right for a sheet metal shop that is only making one kind of an article, or installing only one kind of furnace, and has only mechanics that are getting the same rate of pay and can do jobs in the same length of time, but I do not believe Overhead would be distributed equally on each job where there is a different priced labor and material used.

Although he may charge all overhead of the shop to jobs, yet it will not be distributed to the jobs on account of making too much profit on some jobs and get too many jobs with not enough profit added, on account of under and over distribution by the *material and labor cost* of distribution.

For example, let us suppose that a register is being installed, and it takes a mechanic two hours for the installation, and that he is paid 50 cents per hour, and the register costs \$1.00, this register would cost two dollars for labor and material, and if overhead is figured at 50 per cent of Material and Labor, it would be one dollar, making the job cost three dollars.

Then suppose that we do another job that takes the same length of time, and the same material only a higher priced unit, say of bronze, which costs us for the material

By JOSEPH G. DINGLE  
C. P. A.

\$4.00, this job would cost the same as the other as far as time and labor was concerned, but by adding an additional cost to the material the overhead is increased from \$1.00 to \$2.50. It seems to me that when it takes the same amount of time to do one job as it does the other each job should be charged with the same amount of overhead.

The table shows the following:

	Japanned	Bronze
Material .....	\$1.00	\$4.00
Labor, 2 hours.....	1.00	1.00
Overhead, 50 per cent material and over- head .....	1.00	2.50
Cost of job.....	\$3.00	\$7.50

This looks like one job is overcharged, or that the other is undercharged, as it takes the same length of time to do both jobs, and overhead is determined by the element of time.

For estimating purposes I think it would be better to figure the overhead expense on the basis of Productive Hours Labor, which can be easily done in any size sheet metal shop, by only keeping a card of all non-productive labor hours, and deducting this total from the total hours worked during the month, and dividing this into the total overhead expense for the month. This will give the direct labor hours cost per hour, and in figuring a job it is only necessary to know how many hours of direct labor it will take to do the job to be able to figure the overhead.

If material, labor and overhead

are added together to make the total cost, then the profit is added which will be the selling price. By figuring overhead by this method each job will be charged its proportionate part of the general overhead expense regardless of the cost of material or what price is paid the mechanics for their work.

As an illustration, the first example will be used. On these jobs it takes the same number of hours to do each job. Suppose we have for the two hours \$3.50 to be distributed as overhead, which was distributed in the first example, this would be 87½ cents per hour to be distributed to each job.

	Japanned	Bronze
Material .....	\$1.00	\$4.00
Labor, 2 hours at 50c..	1.00	1.00
	\$2.00	\$5.00
Overhead, 2 hours at 87½c .....	1.75	1.75
Total cost .....	\$3.75	\$6.75

By comparing this example with the first, it shows that the same overhead has been distributed, but the japanned register was short 75 cents of being charged enough, while the bronze register job, which needed the same length of time was overcharged 75 cents. If 10 per cent profit was added to each in the first example the selling price would be \$3.30, and the bronze job \$8.25, you can see that on the japanned job there would be a loss of 45 cents, while an excessive profit would be made on the other job.

Yours very truly,

I. F. Jennings,  
Sec.-Treas. Baxter & Co., Inc.,  
Sheet Metal Workers.

# Here's What Mr. Dingle Replied

**M**R. I. F. JENNINGS, secretary-treasurer of Baxter & Co., Inc., of Welch, W. Va., has written a very interesting letter on the subject of applying overhead in a Sheet Metal Shop on Productive Hours. We wish more of the readers of the *ARTISAN* would give us their views on this interesting and vital subject.

There are several points in Mr. Jennings' letter I wish to comment on. Before proceeding with my comments, I wish to call Mr. Jennings' attention to my statement, in the first column on page 19, November 22nd issue, wherein I stated my remarks were addressed to the average shop. Mr. Jennings, in my opinion, is well qualified to handle his overhead on the Productive Hour basis and it will, no doubt, prove quite successful. It is, however, a more complicated method than the Material and Labor basis, and, in the average shop, can not be used as accurately.

Mr. Jennings gives two examples of pricing jobs—using in each the installation of a register—one japanned and the other bronze. In the example where he spread overhead at 50 per cent of Material and Labor cost, he has a cost of \$3.00 for the japanned register and \$7.50 for the bronze. Applying overhead at 87½c per productive hour, his costs are \$3.75 and \$6.75 respectively. He then states that by using the Material and Labor method, the japanned job was underpriced 75c, while the bronze job was overpriced 75c.

In the first place, I am sure you shop owners will agree with me that a bronze register cannot be installed for the same labor cost as a japanned register. The mere fact that a bronze register is used indicates that it is a fine residence, and that

the installation must be very carefully made.

For the sake of presenting Mr. Jennings' examples for your study, I shall use his figures, and discuss the question of price to each of these two customers. In his examples he uses the following figures:

1 Japanned Register, costing .....	\$ 1.00
1 Bronze Register, costing..	4.00
4 hours Productive Labor at 50c .....	2.00
Overhead .....	3.50

Total Costs—Material,  
Labor and Overhead..\$10.50

We can see at a glance that overhead equals 50 per cent of material and labor costs. We can also see that it equals 87½c per productive hour. Our problem, then, is to dispose of \$3.50 of overhead against these two jobs in some fair and equitable way. For purpose of argument, I am conceding that the bronze register can be installed in the same length of time as is required for the japanned register.

The japanned customer received material costing \$1.00, and labor costing \$1.00, or a total direct cost of \$2.00.

The bronze customer received material costing \$4.00 and labor costing \$1.00, or a total direct cost of \$5.00.

These two jobs are now ready to be loaded with overhead. One job has a direct cost of \$2.00 and the other a direct cost of \$5.00. Mr. Jennings then proceeds to dispose of his \$3.50 of overhead by loading \$1.75 on each job—as each job uses 2 hours of productive labor. If \$1.75 overhead is proper for a job costing, for material and labor, \$2.00, then how can one justify using that same overhead on a job

costing, for material and labor, \$5.00? Look at it from all angles and justify charging the same overhead to a job costing 2½ times the other. One customer has his prime cost loaded 87½ per cent for overhead while the other is loaded only 35 per cent. Is that method fair to the fellow who buys the japanned register? It is true Mr. Jennings charges these customers for the \$3.50 of overhead. The big question is—Does his method result in a fair and equitable distribution of \$3.50?

Overhead is incurred for the business as a whole. It is not specifically related to either direct labor or to materials. The business, of itself, is a combination of labor and material and, in my opinion, should consider both of these items in charging overhead. To say that a customer purchasing a japanned register, costing \$1.00 should make the same contribution to overhead as a customer purchasing the bronze register, which cost \$4.00, is unusual. On the same basis, if it be possible to install material, costing several hundred dollars, at a direct labor cost of two hours, we would still use 87½c as the overhead cost. This, notwithstanding the fact that the delivery of the material may have consumed a day's time of the truck—which, of course, is not included in productive hours.

I am thoroughly convinced that for the average sheet metal shop overhead can be more easily, more accurately and more equitably distributed over work done as a load on the total of direct material AND direct labor costs. Let the customer pay only for what he gets.

I believe the prices of \$3.00 and \$7.50 for these two jobs are more fair both to the customer and the shop owner than Mr. Jennings' prices of \$3.75 and \$6.75.



# FAN BLAST ENGINEERING

By PLATTE OVERTON  
Heating Engineer

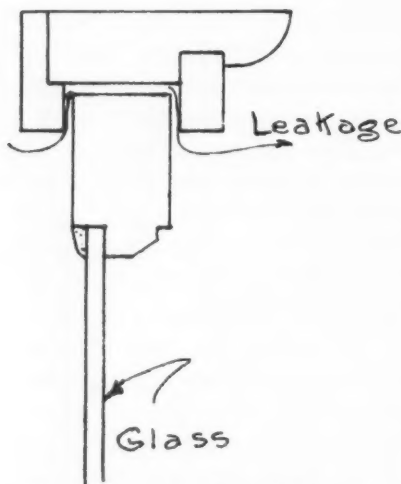
## Infiltration

**I**N the last issue (Feb. 16) we covered items 1 to 7 inclusive on our data sheet.

Our next item, No. 8, is "Exposed sash and door perimeter." This is the lineal feet of all door and window edge where infiltration is a possibility. (See sketch.)

Item 1 is leakage in B.t.u. per foot of perimeter. The leakage per foot depends of course on the width of the crack or opening and the wind velocity. And also the temperature difference between outside and inside.

The range of loss is wide and we may say that for a 70 degree differ-



No unstripped sash ever fits 100%.  
Leakage occurs as shown here

ence in temperature the loss in B.t.u. per foot of edge in *plain, unstripped wood* window will vary from 62.5 B.t.u. with a five-mile wind to 634 B.t.u. with a 50-mile wind.

For average results with this unstripped wood window we will strike a medium of 134 B.t.u. with a 10-mile an hour wind.

For windows that are *weather stripped* we will have under the same conditions a loss of 18 B.t.u. per perimeter.

These factors may vary. In most new building it will be noted that the windows are fairly tight, but in one to three years the frames and sash shrink and the opening size increases. To the best of our knowl-

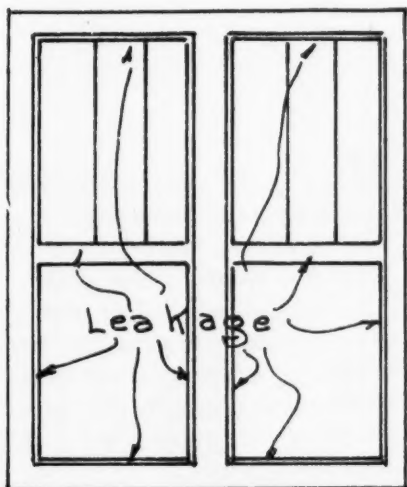
edge the above factors are safe for the average condition.

Item 23, it will be noted, is "Deduct for Heater Size." This item is 50 per cent of item 21 and is deducted from the general total as the wind will blow from only one direction at a time. (See sketch.) In other words, if the wind is in the west our rooms on the east will have "exfiltration" in place of infiltration.

Rooms No.	1	2
Use		
<b>MEASUREMENTS</b>		
1. Room Dimensions		
2. Cubic Feet Space		
3. Room Floor Area		
4. Floor Const. & Factor		
5. Ceiling Const. & Factor		
6. Window Const. & Factor		
7. Wall Const. & Factor		
8. Exposed Sash and Door Perimeter, equiv.		
9. Leakage B. T. U. per ft. of Perimeter		
10. Expd. Wall Gross Area		
11. Expd. Window Gross Area		
12. Expd. Wall Net Area		
13. Exposure Direction		
14. Room Temperature		
<b>HEAT LOSSES</b>		
15. Wall Loss B. t. u. per Hr.		
16. Window Loss B. t. u. per Hr.		
17. Subtotal Loss B. t. u. per Hr.		
18. Expos. Allow. B. t. u. per Hr.		
19. Floor Loss B. t. u. per Hr.		
20. Ceiling Loss B. t. u. per Hr.		
21. Leakage Loss B. t. u. per Hr.		
22. Total Heat Loss		
23. Deduct for Heater Size		
24. Heater Building-loss Load		
<b>SERVICE</b>		
25. Air Supply C. F. M.		
26. Recirculation C. F. M.		
27. Air Supply Inlet Temp.		
28. Air Supply B. t. u. Service		
29. Direct Radn. B. t. u. Service		
30. Direct Radn. sq. ft.		
31. Grav. Ind. Radn. sq. ft.		
32. Aspir. Coils Radn. sq. ft.		

This is the item list of the data sheet. When every item is calculated the contractor knows he can't go wrong with his system

Here we see that such rooms will have no loss, but as all rooms are figured for a loss, 50 per cent may be deducted from the total heat loss of item 21. As this effects the



Leakage occurs all around and between both sash

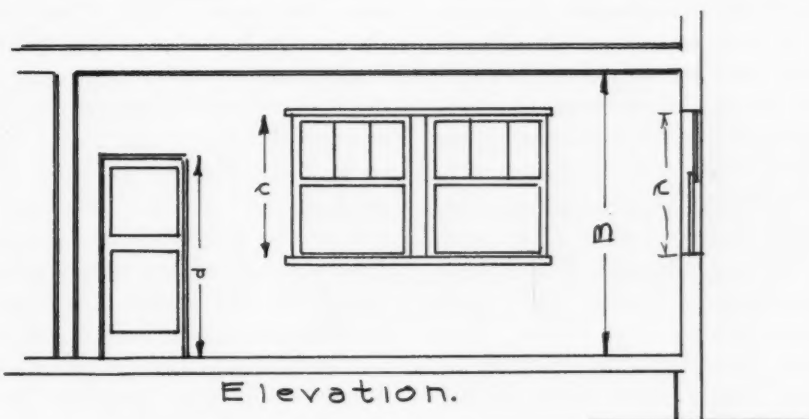
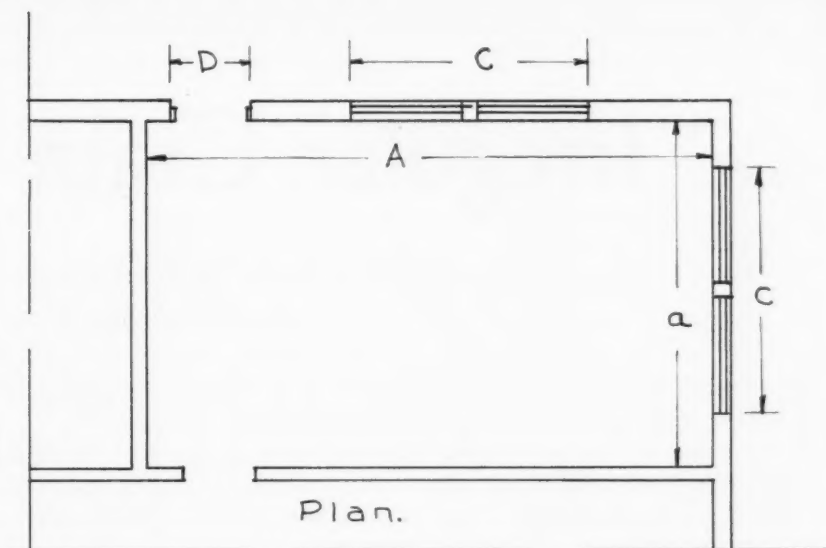
heater size only it is deducted from item 22 on the data sheet.

Items 10-11-12 are exposed surface areas and are shown in sketch.

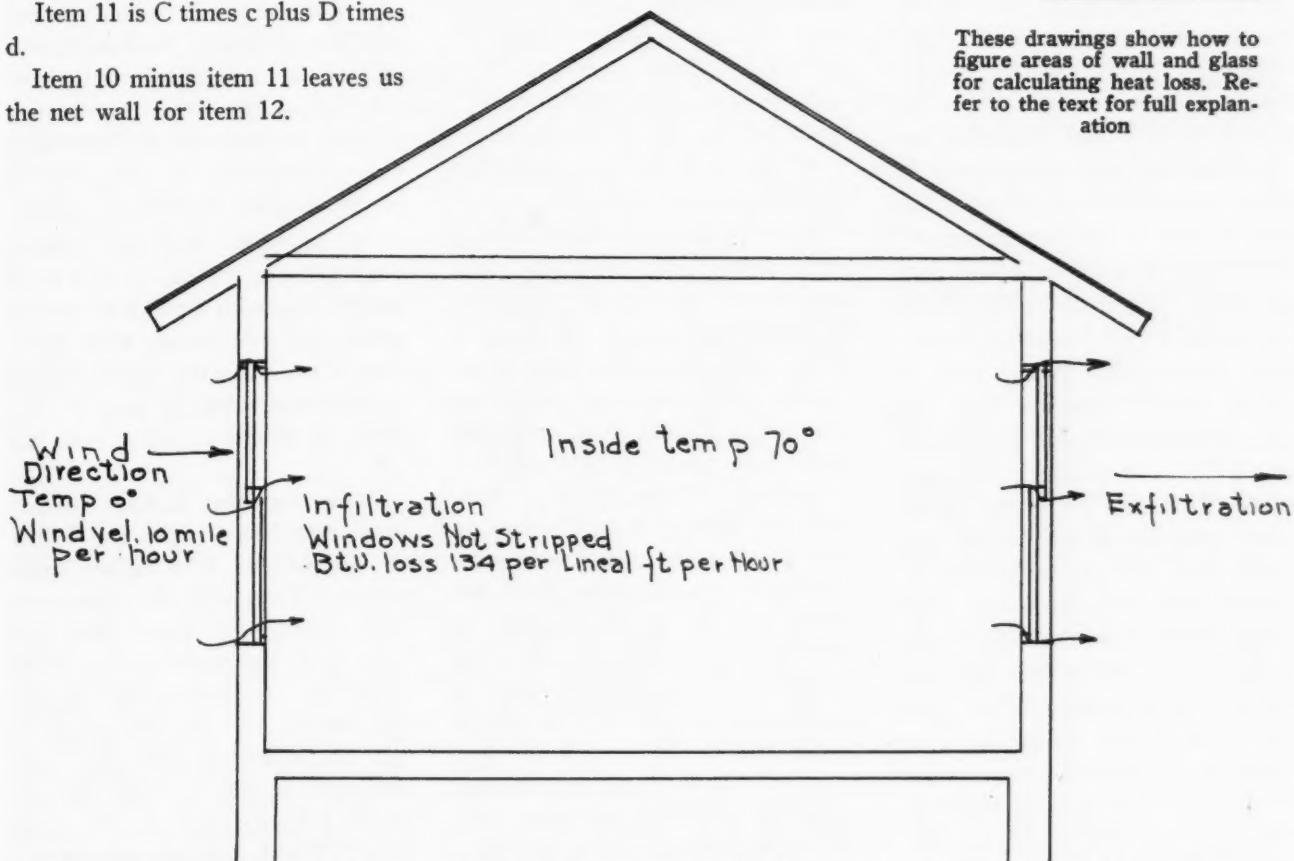
Item 10 is  $A$  plus  $a$  times  $B$ .

Item 11 is  $C$  times  $c$  plus  $D$  times  $d$ .

Item 10 minus item 11 leaves us the net wall for item 12.



These drawings show how to figure areas of wall and glass for calculating heat loss. Refer to the text for full explanation



On every structure there is a "pressure" side and a "loss" side. Infiltration occurs on the "pressure" side and exfiltration on the "loss" side

# Irregular Grain Chute

By L. F. HYATT

*Contributing Editor*

**T**O begin the plan of the grain chute first draw the rectangle representing the top opening of the fitting. It will be noted that in this fitting the horizontal center line will pass through two corners c and a of the rectangle. Letter the four corners a, b, c, d as shown. Next draw the horizontal lines m-n and c-a in the elevation representing the upper and lower lines of the collar. These may be of an indefinite length. Draw vertical lines from the four corners of the plan a, b, c, d intersecting the horizontal lines representing the collar of the elevation view at c, d, b, a. Now draw the vertical line a to 1 the desired length. Next draw the line 1-7 equal in length to the diameter of the round outlet, and at the angle necessary for the outlet. At right angles to this line draw the center line 4-10 to 4' and upon this line draw the rectangle representing the collar and the half circle representing a half of the round opening. Divide this half circle into six parts as shown. Draw lines parallel with the center line intersecting line 1-7 and locating the points 1'-7' as shown on the elevation view. On the center line of plan B draw the circle C and divide it into 12 equal parts. Draw horizontal lines to the plan view as shown. Then drop lines from the points on line 1-7 intersecting the horizontal lines from circle C and draw the curved line through the points of intersection. This represents the opening at the point where the collar joins on. Connect these points with the corners a, b, c, d thus completing the plan view. Connect point 7 on the elevation with c, d, and b on the elevation. Also draw a line

from 1 to b thus completing the elevation view.

It is now necessary to obtain the true lengths of the lines. First draw the line x y of an indefinite length, also the other horizontal lines from points 1, 2, 3, 4, etc., as shown. On the line x y locate point b and from point b on the plan take the distance b to 10 and step it off on the horizontal line x-y from point b and number the point 10 as shown. From point 10 drop a line to the horizontal line drawn from point 10 on the elevation locating 10', and connect the point of intersection with point b. In a like manner take the distance b-11 found on the plan, step this distance off as before on the horizontal line x-y, and drop a line intersecting the line from point 11. Then connect this point with point b found on line x-y. Continue in the same way with the other two lines of this group, 12 and 1.

Next locate point c as desired on the line x-y, and from this point step off the distance c-7 found on the plan and number the point 7. Drop a line from this point intersecting the horizontal line from point 7 in the elevation, and draw a line from the point of intersection to point c on the line x-y. Now take the distance 8 to c found on the plan and step it off from point c on line x-y, drop a line from this point intersecting the horizontal line from point 8 on the elevation, and draw a line from the point to point c on the line x-y. It will be noted that the distances 8 and 6 to c are the same length on the plan, and the horizontal line from point 8 also represents 6 on the elevation. The same is also true with 5 and 9 and 4 and 10 in the c group of lines.

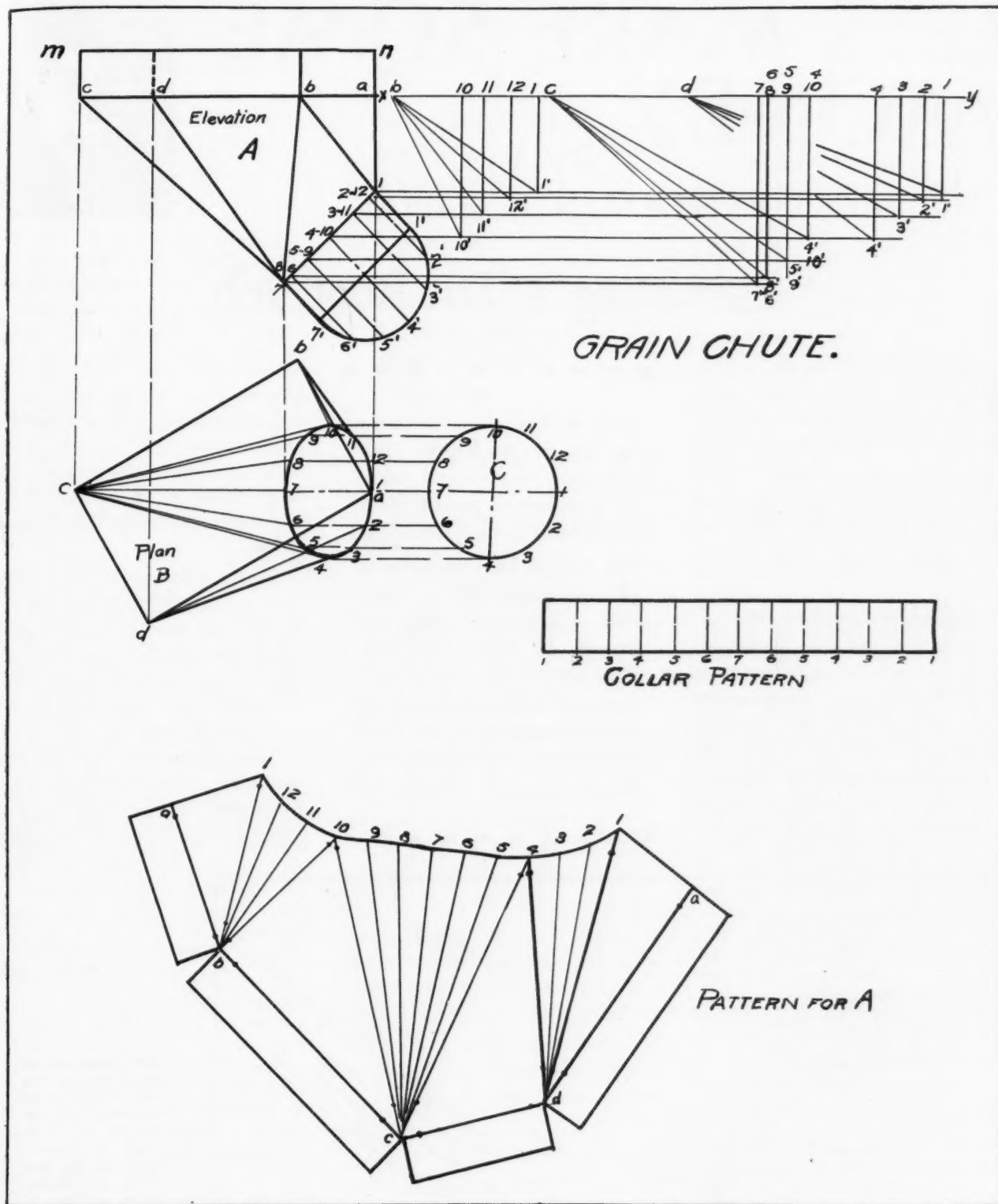
Continue in the same manner with the other lines of this group.

To economize space point d on line x-y is located so the c and d group of true length lines overlap, and to avoid confusion the true length lines of group d are shown broken. Proceed with this group exactly as with groups b and c with points 4, 3, 2, and 1.

To start the development of the pattern for part A first draw the line 7-c. The length of this is of course taken from the c group of true length lines, 7'-c. Next from this group of lines take the distance 8' to c and with c on the pattern as a center strike arcs each side of line 7. Now from the circle C, which represents the round opening take the distance 7 to 8 and with point 7 on the pattern strike arcs intersecting the arcs just drawn, locating points 8 and 6. Now with c as a center and the distance 9'-c on the true length lines as a radius, strike arcs of indefinite length. Next take the distance 8 to 9 from circle C and with 8 and 6 as centers strike arcs intersecting arcs previously drawn locating points 9 and 5. Continue with the lines of this group up to and including c-10 and c-4.

Now from plan B take the distance c to d as a radius and with c on the pattern as a center strike an arc. Then with the distance d to 4' on the true length lines, and with 4 on the pattern as a center strike an arc intersecting the arc just drawn, locating point d of the pattern. Continue with the other points 3, 2, and 1. Take the distance 1 to x found on the elevation and with 1 on the pattern as a center strike an arc. From the plan take the distance d to a as a radius





and with *d* on the pattern as a center strike an arc intersecting the arc just drawn, locating point *a* of the pattern. This completes this side of the pattern. Now with the distance *10'-b* on the true length lines as a radius, and *10* on the pattern as a center strike an arc of indefinite length. Next with *c* to *b*

found on the plan, as a radius, strike an arc intersecting the arc just drawn, locating point *b*. Continue with the other points of the *b* group of true length lines. The line *1-a* on the pattern is of course the same as *1-a* on the other end of the pattern and is taken from *x-1* on the elevation.

The width of the rectangular allowances on the pattern are made equal in width to the distance *m-c* on the elevation. It will be noted that all corners of this rectangle are right angles. The collar is drawn in the usual manner. Add allowances for seams and laps, thus completing the patterns.

# LET'S MAKE SOME MONEY

by  
BENJAMIN F. JOHN



## Estimating a Tin Roof Job

**D**ID you ever estimate on this kind of a job? All roofing shops run into something like it once in a while, and it comes under the head of jobbing.

Let's estimate on it together, and then we will print the COST sheet and estimate sheet, and compare them.

### Character of the Job

This is a five-story home (see sketch); the fifth story front and side is a  $67\frac{1}{2}$  degree pitch mansard roof with three dormer windows, covered with old roll Spanish tile, which was laid over fifty years ago.

Each tile measures  $12\frac{1}{2}$  in. by 8 in. and was fastened with two

**The surest way to make money is to know your estimate covers all costs and includes a profit. Here is a problem in estimating.**

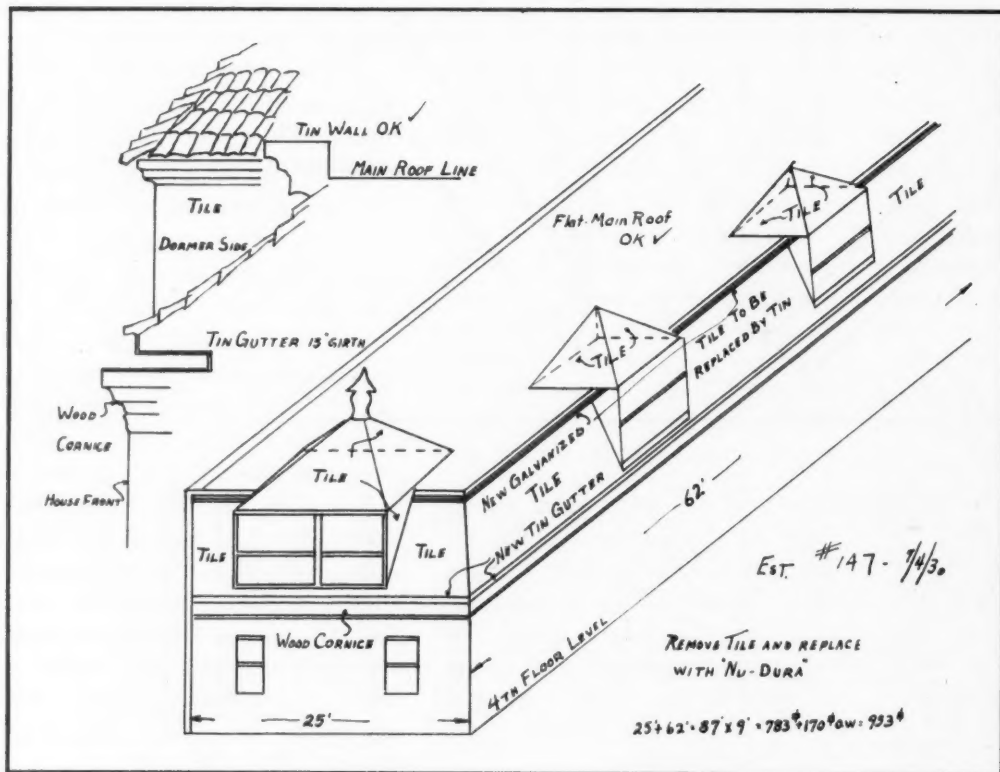
**We would like readers to sit down and tell us what they would price the job at. B. F. John will conduct the class. In a later issue we will analyze your answers and give the estimate and cost sheet for the actual job. Let's go!**

wrought iron nails. The tile weigh between  $7\frac{1}{2}$  and 9 lbs. each.

Movement of the tile wore off the heads of the nails, and wore the stubs to a point. Several tile fell during windy weather and the roof was considered dangerous to passers-by.

The three dormer windows roofs came to a point, similar to an inverted cone, and had four sides above the roof line, and extended over the mansard sides at the base. The sides of the windows and roof were covered with tile.

The height of the mansard roof is 9 feet, and the two sides measured: front, 25 feet, plus side, 62 feet; total 87 ft. by 9 ft. equals 783



This plan shows the layout of the job. Parts to be removed and replaced are indicated. The drawing plus the text gives all dimensions, and the table shows the required materials. The construction of the present roof is shown in the upper detail

sq. ft. surface, plus 170 sq. ft. for window roof and sides equals total surface 953 sq. ft. to be covered.

### The Specifications

The roofing contractor to furnish the necessary scaffolding and remove the present tile from two mansard sides, and roofs and sides of three dormer windows. prevent tile from falling when being removed, and protect the

Provide necessary protection to grass plots below, with boards and canvas, from falling dirt and debris.

Remove the old tin gutter at the base of mansard roof.

After the tile are removed, the entire surface is to be made clear of all nails and the sheathing to be repaired or renewed where necessary.

All surfaces of the two mansards and dormer windows to be covered with "NU-DURA" tin (see paragraph at the end, What is Nu-Dura?) laid in courses not wider than 17 inches from standing seam to standing seam; cross seams to be well soldered.

Painted on the under side before laying, with two coats of brown oxide of iron paint mixed over rosin-sized sheathing paper, and finished with one coat of red with pure linseed oil, and laid oxide of iron, ground in pure linseed oil and two coats of olive green lead paint ground in oil. Each coat of paint to be applied only when the previous coat is thoroughly dry.

The tile finials on the windows to be replaced with metal finials of stock design, as near as possible to watch the present ones.

The metal cornice at the head of the mansard roofs shall be renewed with a galvanized iron cornice, painted with galvanum paint and finished green.

The present tin gutter at the base of the mansard roof is to be renewed with Nu-Dura tin, and finished similar to the roof.

And damage done to the main top roof of the building during the process of the work shall be repaired or replaced and placed in good condition. Any damage done to the interior or exterior due to leaks shall be repaired or replaced.

All debris and old tile shall be removed from the premises and

### MATERIALS REQUIRED ESTIMATED

10 Rolls 28" Tin  
3 Bars Solder  
5 Gals. of Paint  
20 Lbs. Nails  
1/2 Lb. Cleats  
3 Rolls Sheathing  
6 Sheets Gal. 26/36/96  
2 Finials (see sketch)  
25 Lbs. Cement  
Scaffolding  
Truckage \$25.00

the premises left in a clean condition.

The roofing contractor shall present a copy of his workman's compensation and liability insurance policy upon request.

Payment to be made within 30 days after the completion of the contract and approval of the owner.

### Comments on the Job

Four hours was included in the estimate for examination help.

It was decided when estimating at the job, that the scaffolding could be built from the mansard gutter, and the boards extend through the opening of the lower sash; uprights inside and outside for braces. Canvas fastened across outside uprights. For dormer windows, the scaffolding could be placed through the upper sash opening in the same manner.

It was estimated that 2,000 tile would be handled.

The sheathing was 1 1/2 boards and only required nailing in a few places. Nails were easily removed, due to their worn condition.

Cornice moulding, 18-inch girth; tin gutter, 24-inch girth.

Referring to the foregoing estimate, while the selling was done largely by the drawing or sketch as shown, still it was necessary to send the owner a letter, as he requested.

The following is a copy:

Dear Sir:

We have made an examination of the tile covering on the mansard roofs sides and dormer windows, as well as the metal gutters, at the above property, and submit the following report and estimate for your approval.

The tile covering the mansard sides and dormer windows is gradually sliding off, due to the fact that the heads of the old iron nails have worn off. Some tile have already fallen.

These tile weigh about 10 lbs. each and fall to the passageway in front and sides of the building. This condition is dangerous to passersby or for anyone entering the house.

We would suggest removing all these tile and cover the surface with NU-DURA tin, which is guaranteed for 15 years, and will last a lifetime, with ordinary attention.

This Nu-Dura tin to be laid in courses 17 inches wide, and laid over sheathing paper in full sheets; painted on the underside before laying, and then finished with red oxide of iron paint, and finally finished any color you may select from the enclosed cord. (Sample of Nu-Dura was submitted to you.)

It would be almost impossible to relay the present tile, as these are weatherbeaten and brittle, and the nails holes have become quite large due to the wear. Such a roof would be very costly, and the tile may break in the storm and wind.

We will provide the necessary specifications for Nu-Dura tin for material and scaffolding and lay the roof in accordance with your the sum of (——).

We carry compensation insurance for the workmen's protection, and public liability insurance. A copy of our policy we will be glad to present to you.

This estimate is sent in duplicate for your convenience, as at the bottom you will find a simple contract form. One for your file and one to be returned to us in the enclosed stamped envelope, should you decide to wish us to fulfill this contract.

Soliciting your order, which would have our prompt and careful attention. Very truly yours.

P. S. We would be glad to call again and explain any detail you may wish, at your pleasure.



## These Contractors Mark Every Job, Do You?

ONE of the cheapest forms of advertising yet devised for the furnace dealer is the use of name plates or some form of individual marking to be put in some

This being so, why isn't it logical for every contractor to mark his equipment so visitors will know who installed the heater?

Shown on this page are several

enamel and every one of his furnaces are painted this color.

There's nothing wrong with that sort of marking, is there?

The remainder of the plates excepting the big casing one, are brass plates with backgrounds of either black, blue, or red. In all cases the name of the contractor and his address are right there for anyone to read. They can be applied in a



conspicuous place on every furnace installed.

Yet in spite of its cheapness, name-plating is a lost art so far as most contractors are concerned.

A lot of the boys say this form

Above is the plate of Charles Hauck. The background is black on brass. The plate measures 5 inches by 1 inch. Hauck also uses a small, all-brass plate, for special places



This large Lennox marker on the casing is in a bright spot. It gives the name of the furnace and the contractor large enough so that anyone can read the letters

Right is a paint job of Adolph Munkel. The color is a striking green. Each leader shows what room it heats, but the pasted tab also names the installer, gives his address, phone number, etc.



types of markers now being used by progressive contractors. One of the pictures shows a special system used by Adolph Munkel of Columbus, Ohio, who has also picked out a peculiar shade of green

few minutes with self tapping screws.

By way of a practical hint—don't put the plate above the fire door, for it soon becomes blackened and can't be read. A better place is around on the bonnet facing the stairway. Or if this is a dark spot, out where the light can strike it.

That's another good hint—be sure it is out in the strong light, otherwise it can't be read.



B. F. John, Philadelphia, uses this black and brass plate. It measures 3 inches by 1 inch. Mr. John reports it brings business

of advertising is useless, since no one ever visits the basement excepting the owner and he already has the furnace and is only waiting to kick.

But these contractors forget that in this day and age, the basement is one of the most popular places in the house, especially for experimental purposes.

This marker is made of aluminum with a light blue background. It makes a very striking plate. Every Moncrief dealer uses a similar plate, changing the name. This plate is 4 by 2 1/4 inches



## A Display Floor Which Builds Business

SEVERAL years ago, the plumbing and heating industries began a campaign to make every shop a sales floor on which could be displayed products which folks needed in their homes. What that campaign accomplished is well known to every business man.

The same sort of a campaign should be carried on in our industries. We need more and better display floors.

Of course we have a lot of such floors. For example, the illustrations on this page show the display floor and office of F. Christen & Sons Company of Toledo, Ohio. This firm does a general sheet metal



The two illustrations above show two views of the display floor. Note the variety of roofing materials shown and the various metal downspouts and conductor heads. Below is the truck fleet lined up for a picture

and roofing business. An idea of the size of their roofing business can be gained by looking at the fleet of trucks they keep busy.

But stop a moment and look at their display floor. The offices around the sides are enclosed in small structures built to look just like houses. On the walls are examples of the kind of downspouts and conductor heads this firm can supply.

All around the eave is an assortment of different shapes and mate-

rials made up into gutters and cornices.



Above the eaves are all the types of roofing materials this firm sells and installs. And at the same time these materials are made up into different patterns of laying and different types of roofs.

Right out in front where everyone can stop and look is a large revolving rack holding GOOD pictures of the firm's latest and best jobs. And the pictures are accompanied by explanation of location, material and construction.

The ceiling of the room is of metal, a product which this firm also sells and installs.

It should be mentioned that every detail of erection on the displays is of the very best. The prospect is encouraged to examine the materials and the workmanship as closely as desired and the company guarantees to duplicate both on any job.

# APPLIED

## FAN FUNDAMENTALS [Part I]

### What Can and Can't Be Done With Fans

By G. A. VOORHEES

Heating and Ventilating Engineer,  
Indianapolis, Ind.

**H** EAT, which is present to some extent in even the coldest known substances, is a form of energy whose intensity and quantity can be measured.

Its intensity is measured in America and other countries using the English system of weights and measures, by the degree Fahrenheit, which is defined as 1/180 of the difference between the temperature of melting ice and that of boiling water at sea level.

The temperature of a body does not of itself tell how much heat that body contains any more than the depth of water in a tub tells how many gallons there are.

The unit for measurement of heat quantity is the British thermal unit (B.t.u.), which the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.

The quantity of heat that must be added to one pound of air to raise its temperature one degree is 24 per cent of the quantity required to raise the temperature of one pound of water one degree. Therefore, according to the definition of the British thermal unit, the quantity of heat needed to raise the temperature of one pound of air one degree Fahrenheit is 0.24 B.t.u. This is called the specific heat of air. Specific heats of various substances are given in Table I.

Quantity of heat (B.t.u.) required to raise the temperature of one pound of the given substance one degree Fahrenheit.

TABLE I  
Specific Heats

Water .....	1.00
Birch .....	.48
White oak .....	.48
White pine .....	.47
Concrete .....	.27
Air at constant pressure.....	.24
Glass .....	.20
Brickwork .....	.20
Cast iron and steel.....	.12

In the design of any warm air heating plant, the first step is the determination of the quantity of heat lost from each room in one hour. This is the quantity of heat which the heating system must deliver per hour to effect a "heat bal-

ance" and maintain the desired room temperature.

Heat is lost from a room by transmission and air change. Transmission losses take place through exposed walls, windows, skylights, outside doors, ceilings if the space above it is not heated, and floors if the space below is at a lower temperature than the room.

Losses by air change include the intentional introduction of outside air and withdrawal of room air for ventilation, and "leakage losses" (infiltration) due to the inward seepage of outdoor air on the windward side and outward passage of an equal volume on the leeward side of the building.

Transmission heat loss through a given wall or other boundary of the room is expressed as the quantity of heat in B.t.u. that will be transmitted from the room through one square foot of surface in one hour when the outside temperature is one degree lower than that inside the room. These transmission coefficients for nearly 2,000 types and thicknesses of walls, floors, ceilings, roofs, windows, doors and skylights are published by the American Society of Heating and Ventilating Engineers in the annual *Heating and Ventilating Engineers' Guide* (which may be obtained from the society for \$5).

Since the quantity of heat transmitted per hour through an exposed surface is directly proportional to the difference between the temperature of air in contact with each

With this article, Mr. Voorhees begins a second series of articles dealing with fan work. This second series will show how the fundamental principles discussed last year can be applied to practical work. It is hoped to make this series an open forum for the discussion of problems encountered in fan work. So far as possible, your questions will be incorporated in articles to follow



side of the surface, it follows that when the transmission coefficient is known, the quantity of heat lost by transmission through each square foot of surface per hour may be found by multiplying the transmission coefficient by the temperature difference.

For example: The transmission coefficient for single window glass is 1.13, which means that with the temperature of room air in contact with the inside of the window pane one degree higher than the temperature of the outdoor air, 1.13 B.t.u. will be transmitted from the inside air to the outside air through one square foot of the glass in one hour. If a 70 degree room temperature is maintained when the outdoor temperature is zero, the temperature difference between inside and outside is 70 degrees Fahrenheit and each square foot of glass will transmit  $70 \times 1.13 = 79$  B.t.u. per hour.

If one square inch of warm air leader area delivers 111 B.t.u. to the room in one hour, then the leader pipe area required to offset the transmission loss of heat through one square foot of glass with 70 degrees inside and zero outside is  $79 \div 111 = 0.71$  square inches. Compare this with the Standard Code rule for first floor room leader size:

$$(1 \text{ sq. ft. glass} \div 12) \times 9 = 0.75 \text{ sq. in.}$$

The difference between the results obtained by the direct B.t.u. method and the simpler and easier Standard Code method is only  $0.75 - 0.71 = 0.04$  sq. in. leader per square foot of glass. Thus, the code gives a leader area which is  $0.04 \div 0.71 = 5.6$  per cent greater than the basic direct method.

This slight variation and others that occur in the case of various types of wall construction do not mean that the code is incorrect or inaccurate from a practical engineering standpoint. On the contrary, pipe sizes figured according to code rules are well within the required limits of engineering accuracy as can be demonstrated by figuring warm air leader sizes for

any given room in a residence by both the code rules and the more elaborate direct B.t.u. method.

Since this is true and the code is fundamentally correct, a very convenient means is available for determining the B.t.u. requirements of a given room, and in fan heating in contrast to gravity circulation there are several reasons why it is better to deal with hourly B.t.u. requirements than with the code pipe areas.

$$\begin{aligned} &(\text{2nd floor leader area by Code}) \times \\ &167 = \text{B.t.u. per hour} \\ &(\text{3rd floor leader area by Code}) \times \\ &200 = \text{B.t.u. per hour} \end{aligned}$$

An important distinction must be made between the *calculated* pipe area and the *specified* pipe area for a given room. If a room has a calculated pipe area of 90 square inches the Code provides that since this area exceeds that of a 10-inch pipe, the next larger commercial size, which is 12-inch pipe, shall be

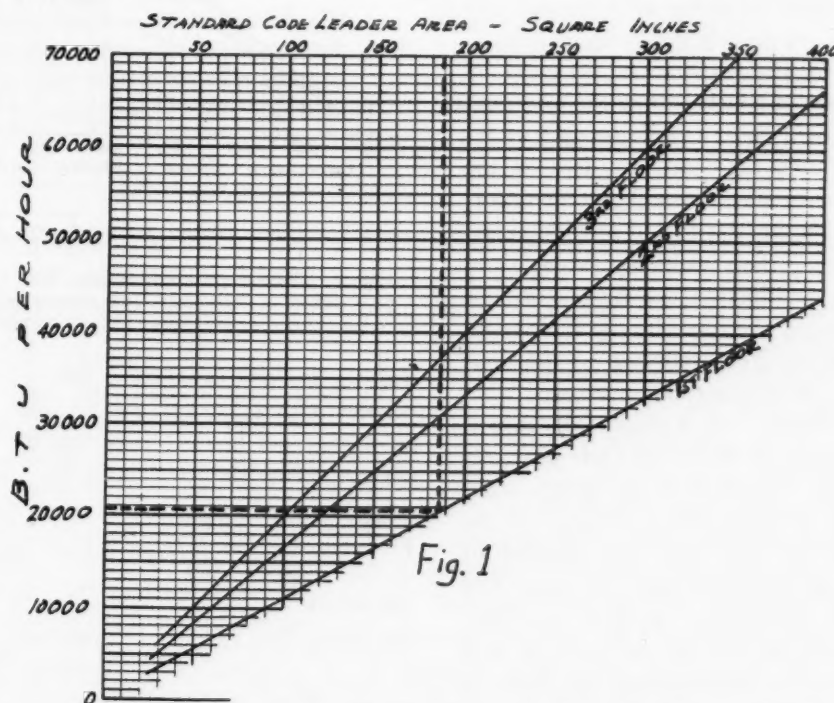


Fig. 1. This chart is to be used to convert square inches of Code pipe area into equivalent B.t.u. values without the need for multiplication

Based on the scientifically accurate research at the University of Illinois, the code assumes that each square inch of warm air leader area will deliver heat quantities as follows:

#### First floor

111 B.t.u. per sq. in. per hour

#### Second floor

167 B.t.u. per sq. in. per hour

#### Third floor

200 B.t.u. per sq. in. per hour

Hence for any room, if the warm air leader sizes are obtained by applying the Standard Code rules, the computed pipe areas can be readily converted into equivalent hourly B.t.u. requirements:

$$\begin{aligned} &(\text{1st floor leader area by Code}) \times \\ &111 = \text{B.t.u. per hour} \end{aligned}$$

used. Although a 12-inch pipe having 113 square inches of area would be installed in this case for gravity circulation, the heat requirement of the room calls for only 90 square inches. The use of the larger pipe is merely a practical convenience to avoid making up a special pipe having exactly 90 square inches of area. The pipe actually installed in this case has an area 25 per cent greater than is needed and if the 12-inch pipe with its area of 113 square inches were used in an attempt to determine the B.t.u. requirement of the room, it would give an *apparent* requirement of  $113 \times 111 = 12,543$  B.t.u. per hour (assuming it to be a first floor room), whereas the actual re-

quirement is only  $90 \times 111 = 9,990$  B.t.u. per hour.

The factor 136 is sometimes used to convert square inches of heat pipe area into equivalent B.t.u. per hour, but unless it is carefully used, the results are deceiving. This factor, to quote directly from the Standard Code, is the "delivering value of one square inch of pipe, assuming half of the heat is sent to each floor." It is therefore the only logical factor to use in determining the *rating of a furnace* and it is so used in the Code.

Applied to a plant designed by Code in which *half of the heat goes to each floor*, it could be used to determine the total heat loss of the house, but it would not give *correctly* the heat loss of any individual room. This can only be obtained by multiplying the *calculated* pipe area of the room by the factor 111, 167 or 200, according to the floor on which the room is situated.

Figure 1 is a chart for converting square inches of Code pipe area into equivalent B.t.u. values without multiplication. Locate at the top of the chart the number of square inches of calculated pipe area of the room; project vertically downward to the intersection with the line representing the floor on which the room is located; project horizontally to the left from this point to the scale of B.t.u. per hour.

Example: Assume a first floor room having heat losses corresponding to 120 square feet of glass surface, 375 square feet of net exposed

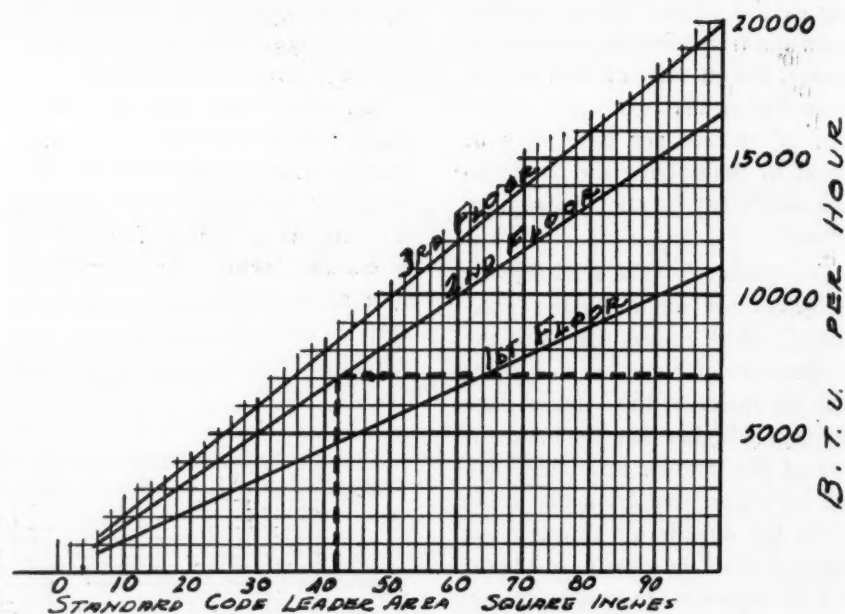


Fig. 2

Fig. 2. This chart supplements Fig. 1 in that it is more accurate for Code pipe areas of less than 100 square inches. The two charts should be used together

wall surface and 3,600 cubic feet of content with a leakage loss of one air change per hour. According to Code, the required leader area is:

$$\left[ \frac{120}{12} + \frac{375}{60} + \frac{3600}{800} \right] \times 9 = 187 \text{ sq. in.}$$

The dotted line (Figure 1) indicates a B.t.u. requirement of approximately 20,800 B.t.u. per hour for this room. By calculation, it is found to be:

$$187 \text{ sq. in.} \times 111 \text{ B.t.u. per inch} = 20,757 \text{ B.t.u.}$$

The greater accuracy in dealing with rooms having computed Code

pipe areas of 100 square inches or less, the chart in Figure 2 will give more accurate results than the larger chart. Suppose a second floor room has a computed leader area (*not stack area*) of 42 square inches. The dotted line (Figure 2) indicates that the B.t.u. requirement of this room is approximately 7,000 B.t.u. per hour. By calculation it is found to be:

$$42 \text{ sq. in.} \times 167 \text{ B.t.u. per inch} = 7,014 \text{ B.t.u.}$$

The very small percentage of error due to use of the chart is well within the limit of allowable variation.

## Rummel Sells a \$700 Replacement Job

(Continued from page 15)

Code. Because the system is to be forced air the sizes of the leaders are figured according to code using the factor 6 for both the first and second floor in place of 9 for the first floor and 6 for the second. Then these leader sizes are reduced just 50 per cent for forced air. This rule has proved readily workable and also adequate.

The return air ducts are designed to carry 2/3 more than the warm air side. This insures a plentiful supply of return air at the fan and also a constant pressure for the fan to work on. It also eliminates some of the rush of return air through the rooms when the fan is operating on high speed.

The forced air unit consists of the dual fan and condenser motor

made by the Peerless Electric Co. This unit consumes a small amount of current, takes up little room and has a three speed condenser motor which permits varied speeds.

The fan is operated automatically by connection with a Mercoid furnace control. The furnace is coal fired using a Time-O-Stat temperature control located in the hall-

(Continued on page 58)

# Ohio Sheet Metal Contractors Hold Optimistic Convention

**The keynote of the Ohio meeting was optimism. The program was filled with speakers of unusual excellence. Their addresses were up to the minute in pertinent advice and information. It is regrettable that most of the addresses were delivered without notes and no stenographic report is available. We reprint here the gist of the most important talks. They are worth reading and thinking about.**

**T**HIS year's annual convention of the Ohio Sheet Metal Contractors' Association was held February 17, 18 and 19 in the Deshler-Wallick Hotel in Columbus.

In spite of poor business conditions during 1930, the convention was attended by more than 150 members of the Association with almost two-thirds of those registered being contractors.

What the meeting lacked in numbers, it more than made up for in enthusiasm. One of the striking features of every one of the meetings was the splendid attendance. This year there was a notable absence of the "guest room" conferences and most of the men registered sat throughout every meeting.

This enthusiasm was due in large measure to the very excellent program which was presented. It was the consensus of every one attending that the entire list of speakers was above average and their subjects were presented so that every man got a lot out of each address.

## New Officers

While the election of officers was not held until the last day, interest centered around this event and the committee in charge of presenting the nominations took plenty of time to elect such officers as could be relied upon to carry on the work for

1931 aggressively.

The list of officers elected is contained in an adjoining column.

## Tuesday Program

The opening session, Tuesday morning, was given over to registrations. At the same time the committees for Credentials, Resolutions, Nominating, and Special affairs were appointed and met to review active business.

Other than this preliminary lining up of the program, the only big event of the first day was the dinner and dance given by the salesmen's auxiliary in the evening. The program for this dinner was both interesting and varied. A male quartet did some splendid singing and a group of child entertainers also aroused the commendation of the guests. The dance which followed was most enjoyable.

## Wednesday Morning

The real program began Wednesday morning with the address of welcome for the convention by Governor of Ohio, George White. Mr. White was introduced by

Arthur P. Lamneck, congressman-elect from the Columbus district of Ohio. The Governor welcomed the delegates to Columbus and said that he was glad to see so many men from all parts of the state attending a convention in spite of the depressed conditions prevailing in most communities.

Amor E. Bogan, President of the Association, responded and introduced the second speaker on the program—W. B. Burruss of Washington, D. C. Mr. Burruss has been a speaker at several sheet metal conventions and his style of address and inspiring talks have made a name for him among our industries.

## W. B. Burruss

The subject of Mr. Burruss' talk was "Start from where you stand." The idea for this talk was based around the fact that throughout the entire history of civilization the leaders of every age have been men who accepted conditions as they found them and without alibi-ing began from where they stood and built their lives and their progress upon things as they were.

Following are some of the highlights of this inspiring address:

"It has been proved by history that whenever men have things easy they get soft. They become afraid—afraid for their business, afraid for their social standing, afraid of the comments of their fellows. They become soft of mind, of heart and of courage. They feel as though

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**One of the most important pieces of business centered around the Unit Heater Bill. What is now going on in Ohio is likely to be extended to other states. Study the situation and be prepared to fight this move when necessary.**

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life was trying to push them down and they become bitter.

"It has always been like this and probably always will be. But in every crisis, in every period of depression, strong men have arisen and swept aside all opposition, all fear and placed themselves so that history has made a record of their accomplishments.

"These leaders have not always been leaders of national or international repute. Thousands of them have been only leaders in their own small locality, yet their value to history has been none the less and their contribution to progress just as essential as that of their better known brethren.

"Such men start from where they stand. They ask no favors excepting fair play and with what they have built their success. There are just such leaders in this depression. There are just such leaders in the warm air furnace and sheet metal industries and these men will ride over the depression and come out ahead of where they started."

#### A. P. Lamneck

This address was followed by a short talk by A. P. Lamneck of Columbus. Mr. Lamneck said that his message was that every sheet metal and heating contractor must today watch his step or his business would be taken away from him. The speaker cited the slate roofing business, which used to enjoy a widespread and profitable place among sheet metal men and which now has been forced aside by other industries so that it is today a real job to sell a slate roof.

Such also has been the fate of the metal roof. Excepting in some parts of the country, the metal roof has fallen into disfavor with home owners and architects and is slowly relinquishing its former favor to competing forms of roofing material.

What the sheet metal man must do, said Mr. Lamneck, is to get out and sell. He must know all there is to know about his materials and determine to sell just as hard as possible. Only through selling can

our industries compete with those other industries which are striving to get the public's dollar and are exerting more powerful forms of propaganda than we are.

#### Wednesday Afternoon

Due to a change in program arrangement, Mr. J. I. Walker of Columbus who was scheduled to talk on Thursday was the first

### 1931 OFFICERS

**Joe Dersher, President, Toledo.**

**Harvey Orton, First Vice-President, Akron.**

**J. M. Saunders, Secretary, Cleveland.**

**William Feiten, Treasurer, Cleveland.**

### NEW BOARD MEMBERS

**John F. Kienle, Piqua.**

**A. Bogen, Columbus.**

**Frank J. Hoersting, Dayton.**

speaker on the afternoon program. Mr. Walker talked about the Unit Heater Bill which is now causing so much comment all through Ohio.

In explaining what this bill is and how it effects the warm air heating industry, Mr. Walker called attention to a condition in politics which it behooves every contractor to watch closely.

#### Unit Heater Bill

There is in Ohio, Mr. Walker explained, a committee appointed by the legislature whose duty it is to pass on and recommend types of construction for public buildings, particularly school houses.

This committee has been organized for many years and was originally formed to raise the standard of school house construction and design and to see to it that the children had the best and most modern ideas used in the school buildings.

But after this committee had been operating for some years pressure was brought to bear to change ideal conditions to condi-

tions especially favorable to some especial interests.

The condition which is especially acute now is a movement under way in this committee to change the laws governing school house ventilation so that unit heaters are seemingly favored above central heating plants.

In 1919 the first guns of this fight were fired. The purpose then was to make such changes in the state code that less ventilation was required in schools. The fight was continued with increasing bitterness in 1921, 1923, 1925 and 1930.

In 1930 the main fight centered around the attempt to reduce the number of air changes per hour from 6 to 3. This move was successfully fought then but has been pressed ever since.

The Board of Building Standards, or the present setup, was formed in 1923. In 1925 this board changed specifications so as to admit the unit heater. Prior to 1924 all heating was by central systems, but now due to the change more installations of unit heaters are being made every year.

The last move was to change the specifications to permit exhausting room air into corridors. This permits smooth, unbroken walls in each room, but also *eliminates all ventilation stacks or ducts*. In this setup the sheet metal contractor is *entirely out of the picture*.

This has made great changes in the design of small school buildings. As now laid out all the class rooms are grouped around central corridors and air is passed from the rooms through grilles in the partition into the central halls.

This change has been favorable to the unit heaters. Heating the room is done by using unit heaters operating with some 900 c.f.m. These heaters warm the air of the room, and any tendency toward building up a pressure moves the air into the hall.

As can be imagined the fire hazard is great and any fire would be spread all through the building too rapidly for the children to escape.

Mr. Walker said that it should be the effort of the Association and also every heating and metal contractor to fight this rule. So far the fight has been favorable to the metal industry, but it has required constant surveillance over the committee and has cost a large sum of money.

Mr. Walker asked for the financial and moral support of the Association and this was given. The Association went on record as pledging its share of the expense of hiring the best legal talent available and fighting this committee and its rulings to the last ditch.

### **Welding**

This report of Mr. Walker's was followed by an address given by Mr. Hobbs on welding. Mr. Hobbs told how welding has become a fixed and necessary part of the metal working equipment of many sheet metal contractors.

Several ways to arrange and make welding equipment operate efficiently, especially in the larger shops were cited and arrangements of equipment for the smaller shop discussed. Mr. Hobbs gave some of the history of welding and also explained how many and varied are the uses the present day sheet metal shop makes of welding.

### **J. C. Miles**

Following Mr. Hobbs, J. C. Miles, Vice-President, Warm Air Furnace Fan Company, delivered a very interesting and informative address on Air Conditioning.

One of the most interesting parts of this address was the specific example of what one contractor did with an architect when the subject of air conditioning was mentioned.

This heating contractor was frank to admit that he did not know as much about air conditioning as he should, but that he did know someone who knew all there was to be known about it. Because of this frankness the architect, who at the time had a big house job on the boards, permitted this heating contractor to bring in his friend and talk air conditioning.

The architect asked every possible question and before the conference ended had his heating engineer in on the talk also. Practically every angle of air conditioning the home was discussed, with the result that this large home was equipped with a warm air heating plant using forced, cleaned air.

Mr. Miles also cited a heating plant installed in Pittsburgh where a heating contractor sold a plant for some \$8,000. This plant is entirely automatic, uses forced air, and is one of the largest and most modern installations yet built.

Mr. Miles concluded his discussion by stating that one of the most acute problems in forced air heating today has to do with whether or not by-passing air for gravity flow is necessary. Mr. Miles contended that it is.

### **Evening Banquet**

The annual banquet and dance was held Wednesday evening. The dinner was enjoyable with good entertainment and a very peppy main talk.

The speaker appeared behind a bush of moustache and goatee and later proved to be W. B. Burruss doing another character.

Mr. Burruss' talk was genial yet contained many admonitions for those attending. He was introduced as from Wapakoneta and said he would talk about some of the things he had learned by staying mostly to home and minding his own business. He ended up by telling mostly about humorous things he had learned by talking with others in our industry.

### **Thursday Morning**

At the morning session, Joe Dersher of Toledo, Vice-President, presided. The first speaker was Bennett Chapple, Jr., Secretary of the Armco Distributors' Association. The subject of his address was "Let's Talk Over Business." This speech was published in detail in the February 16, *AMERICAN ARTISAN*.

The next speaker on the program was Rabbi Jacob Tarshish, of Co-

lumbus. His subject was "Amos and Andy." Rabbi Tarshish is one of the best known speakers in Ohio and speaks regularly over the radio. His subject was unusual, which, coupled with his fame as a speaker, brought out a record attendance.

It would be impossible to reproduce this address without stenographic notes and these are not available. It was one of the very best addresses heard so far this year and carried a real message for the audience.

Taking Amos and Andy as probably the most famous pair of entertainers yet to appear on the radio horizon, if not on any stage, the Rabbi explained why these two boys are so popular. He related some of his experiences in seeing groups of persons in the most unlikely places stop and listen to this program every evening.

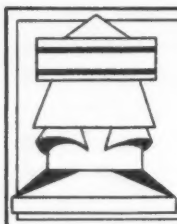
The popularity is due, said the speaker, primarily to the fact that the situations described find actual counterparts in most of our lives. Also there are millions of persons like Amos, who is the steady, hard-working, lovable and reliable partner, whose every move is based on sound common sense thinking. And there are millions like Andy, the big, bluffing, vacillating partner, who undertakes to do anything, solve any problem, and never does—for his kind always fade out of the picture when trouble comes.

So through the entire address these two characters and their counterparts in all our lives were pointed out and used by Rabbi Tarshish as the basis for those morals most of us have drawn from this radio feature.

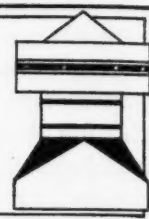
### **Thursday Afternoon**

The morning program wound up practically all the program since the speakers scheduled for the afternoon had already talked. The session was given over to discussion of various problems. By evening most delegates had started home.

The entire program was filled with interesting and instructive addresses, many of an inspirational nature.



# GRAVITY EXHAUST VENTILATION



## A Restaurant Ventilation Problem

**R**ESTAURANT ventilation is a specialty field which brings to the contractor a variety of problems, oftentimes extremely puzzling. Oftentimes, too, when the contractor is called in, the installation has been in operation for a period of time and has failed to work satisfactorily.

The contractor is asked to correct the trouble and make the system work, but always with the proviso that he do as little tearing down and out as possible and do the job without disturbing the operation of the restaurant.

This means that the contractor has to know his stuff before he lays out the changes and the work.

A very good example of this kind of a job is outlined in the letter printed below. This letter came in from one of our readers who was called in on just such a job and wants to be sure he is right before he goes ahead.

Here is what the contractor says:

**AMERICAN ARTISAN,**  
139 North Clark St., Chicago, Ill.

Dear Sirs:

Enclosed you will find a rough sketch of a restaurant. We just don't seem to get it ventilated satisfactorily.

As we see in this paper where so many ask for advice or help, we would appreciate your giving us some advice or help to take us over the hill on this problem. Yours truly,

Gray's Heating and Tin Shop,  
1714 Avenue A,  
Scottsbluff, Nebraska.

The letter and the contractor's sketches were submitted to Paul R. Jordan for criticism and sugges-

**By PAUL R. JORDAN\***

tions. From his study of the problem Mr. Jordan suggests the following:

As I understand this drawing and letter the restaurant is small, has plenty of windows and doors, flat roof, unventilated, a stove over which is a hood 48 in. by 72 in. and some kind of a ventilator close to this hood measuring 30 in. by 48 in. The hood has an 18-in. pipe leading through the roof to a 16-in. ventilator.

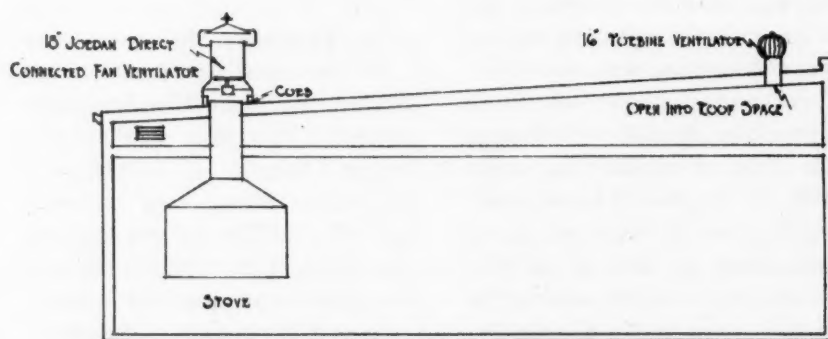
One thing is apparent and that is the ratio between the pipe and hood is not right. The ratio between the hood and the ventilator is worse yet. The hood has an area of 3,456 square inches, while the ventilator neck has an area of 201 inches, a ratio of less than 17 to 1. I cannot understand the reason for this reduction from an 18-inch pipe to a

16-inch ventilator, thereby cutting down the area about 20 per cent. By retaining the entire 18 inches, that is 255 square inches of area, the ratio would be 14 to 1, which is better, but still not good.

Inasmuch as this installation is already in it would probably be best and cheapest to use an 18-inch fan ventilator. This can be easily installed by building a curb 23½ inches square in outside dimensions either of 2 by 4 or 2 by 6, flashing to curb, then setting the fan ventilator down over it, nailing the base fast to the curb, then sealing the joints against both weather and air leakage with roof cement. As this is a flat roof, I assume that it is composition.

The 16-inch ventilator can be taken off and the 18-inch pipe trimmed off a few inches above the roof line allowing it to empty into the fan ventilator base. By sealing the base connection air tight, this

RESTAURANT VENTILATION



SECTION

The ventilation system recommended uses one 18-inch fan ventilator for the range and moves the 16-inch turbine to the front to ventilate the attic space

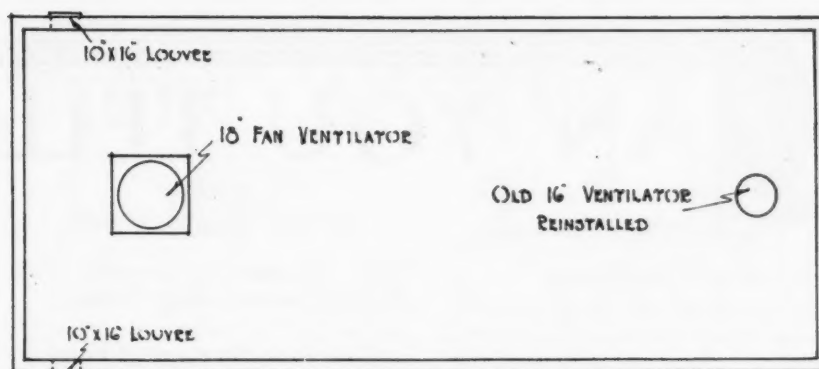
\*The Paul R. Jordan Co., Indianapolis, Ind.



will conserve the entire pulling power of the fan so that the smoke will be sucked up out of the hood.

Now as to the hood; I assume that it is the correct size for the stove and that practically all of the steam and odors come from the stove. The back, front and sides of the hood should be dropped down as low as possible. If the back can be dropped clear down to the stove, that should be done. Also the sides should extend down to the stove and as far forward as the owner will permit. The front of the hood should come as low as it can without interfering with the cooking operations.

This will take care of the hood in good shape and in all probability



ROOF PLAN

The roof plan shows the location of the ventilation and the louvre location for airing the attic space

everything in the way of objectionable odors and steam will be drawn to the hood and out through the ventilator. This leaves only the

matter of roof space ventilation uncared for.

The 16-inch ventilator taken off of the hood stack can be utilized for roof space ventilation. It should be installed in the middle of the highest part of the roof. At each corner of the low part of the roof, tapping into the roof space, there should be installed a louvred opening 10 in. by 16 in. These are for summer use only and should be stopped up in winter.

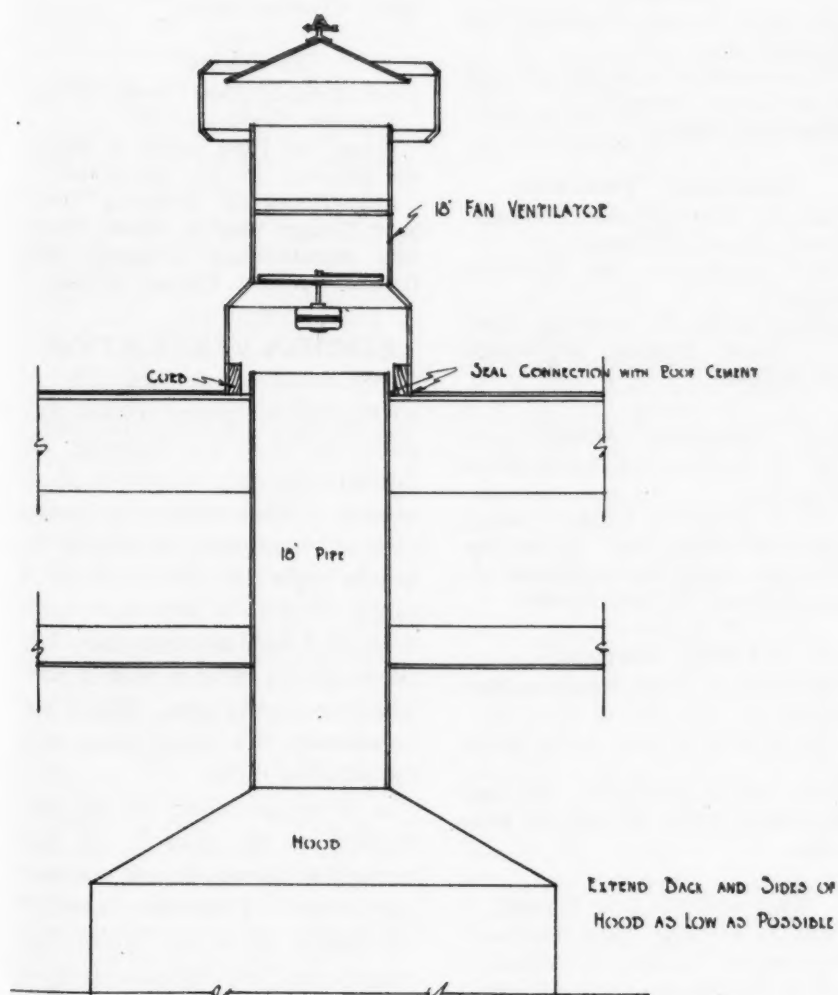
An 18-inch fan ventilator has a rated capacity of 2,025 cubic feet of air per minute, or about the same as a 30-inch ventilator. This will amount to the same as bringing your hood ratio down to about 5 to 1 on a gravity basis, which is about correct. I believe my drawings will explain the installation.

I have, of course, worked out this installation with view to using the present materials and present installations as far as possible. The layout as shown will give good results at reasonable cost.

Automatic intakes placed in the front of the restaurant room should be used on a job of this kind to make it complete, but they usually are not. The advantage of the automatic regulating intake is that it gives a constant and controllable flow of fresh air all of the time. This is directed up off of the floor so as to diffuse at the breathing zone and also eliminate cold spots and floor drafts. A constant supply of

(Continued on page 38)

#### INSTALLATION OF FAN VENTILATOR OVER HOOD



This detail shows the construction and erection of the fan ventilator. This unit means a profitable sheet metal and ventilator installation

# CAN YOU TELL ME?

## Magic Chef Range

From Guy E. Rogers, Corry, Pennsylvania.

Will you please give us the address of the manufacturers of the Magic Chef range?

**Ans.**—American Stove Company, 827 Chouteau Avenue, St. Louis, Missouri.

## Fluted Reamers

From Le Valley, McLeod, Kinkaid Company, Inc., Olean, New York.

Who manufactures fluted reamers for standard bit braces that are used for reaming ends of pipe?

**Ans.**—Greenfield Tap & Die Corporation, 611 West Washington Boulevard; Samuel Harris & Company, 114 North Clinton Street; both of Chicago.

## "Caloric" Furnace

From John L. Felver, Coshocton, Ohio.

Who took over the Caloric furnace, formerly made by the Caloric Furnace Company in Cincinnati?

**Ans.**—Marshall Furnace Company, Marshall, Michigan.

## Furnace Vacuum Cleaners

From the Midland Heating & Ventilating Company, Columbus, Ohio. Orange W. Smith, Rockford, Illinois.

Who manufactures the best known makes of furnace vacuum cleaners?

**Ans.**—Brillion Furnace Company, Brillion, Wisconsin; the Kent Company, Inc., Rome, New York; National Super Service Company, Toledo Factories Bldg., Toledo, Ohio; B. F. Sturtevant Company, Boston, Massachusetts.

## Coal Stokers

From J. F. Werhosek, Morris, Illinois. Who manufactures coal stokers for warm air furnaces?

**Ans.**—List mailed.

## Metal Weather Stripping

From Redondo Sheet Metal Works, Redondo Beach, California.

Where can we get metal weather stripping?

**Ans.**—Allmetal Weatherstrip Company, 229 West Illinois Street; Chamberlin Metal Weatherstrip Company, 704 South Dearborn Street; Federal

Metal Weatherstrip Company, 4538 Fullerton Avenue; all of Chicago.

## Cast Iron Pipe and Elbows

From Roanoke Hardware Company, Roanoke, Illinois.

Where can we get cast iron pipe and elbows to be used as furnace pipe?

**Ans.**—Waterloo Register Company, Waterloo, Indiana; the Faultless Castings Company, Greencastle, Indiana.

## Pewter Metal

From Jiffey Manufacturing Company, Chicago.

Who manufactures pewter metal?

**Ans.**—National Lead Company, 900 West 18th Street, Chicago.

## Gas Furnaces and Conversion Burners

From Keith Furnace Company, Des Moines, Iowa.

Who manufactures gas furnaces and gas conversion burners?

**Ans.**—List mailed.

## "Robertson" Ventilator

From the Behler-Young Company, Grand Rapids, Michigan.

Who manufactures the Robertson Ventilator?

**Ans.**—The H. H. Robertson Company, Grant Building, Pittsburgh, Pennsylvania.

## "Allegheny" Metal

From G. E. Fitzgerald, Battle Creek, Michigan.

Who manufactures Allegheny metal?

**Ans.**—Allegheny Steel Corporation, Pittsburgh, Pennsylvania; *Chicago office*, 122 South Michigan Avenue.

## "Lewis" Humitrol

From Henry J. Leach, Brooklyn, New York.

Who manufactures the Lewis Humitrol?

**Ans.**—Lewis Corporation, 829 Second Avenue, South, Minneapolis, Minnesota.

## "Thermodine" Unit Heater

From the National Retail Hardware Association, Indianapolis, Indiana.

Who manufactures the "Thermodine" unit heater?

**Ans.**—"Thermodine" is the former

trade name of the heater now known as the "Modine" heater. It is manufactured by Modine Manufacturing Company, Racine, Wisconsin.

## "Norge" Refrigerators

From General Sheet Metal Works, Rockford, Illinois.

Who manufactures the Norge Automatic Iceless Refrigerator?

**Ans.**—Norge Corporation, 670 East

Woodbridge, Detroit, Michigan.

## Aluminum Strips

From E. W. Bowman, Sigourney, Iowa.

Where can I get  $\frac{3}{4}$  and 1 in. half oval aluminum strips?

**Ans.**—Aluminum Company of America, Pittsburgh, Pennsylvania; Steel Sales Corporation, 129 South Jefferson Street, Chicago, Illinois.

## Re-tinning

From Reliable Sheet Metal Works, Memphis, Tennessee.

Where can I get prices on plating and retinning vats and equipment?

**Ans.**—Hopewood Retinning Company, Chicago Heights, Illinois; Retinning Manufacturing Company, 3021 Greenview Avenue, Chicago, Illinois.

## KITCHEN VENTILATION

(Continued from page 37)

air through the proper intakes cuts down the rush of incoming air through the door whenever it is opened. Unfortunately, the intake side of restaurant ventilation is usually neglected. The fresh air is simply allowed to seep in through doors and windows when they are closed and to come in with a rush when the door is open. This is not satisfactory, but being usual it is the expected thing.

It is not advisable for the contractor to tie himself up too strongly with costs, beyond ordinary expectations. I therefore have left the intakes off of the layout, but suggest that the contractor mention the desirability of intakes to the owner.

# ASSOCIATION ACTIVITIES



## Chicago Sheet Metal Contrs. Hold Dinner Dance and Meeting

Friday evening, January 9th, was a gala night for the Associated Sheet Metal Employers of Chicago, their wives and the few friends who were honored with invitations to the Fifth Annual Banquet Entertainment and Dance at the Hamilton Club.

The banquet, after generous appetizers, was all that anyone would want. As for the entertainment, it hasn't yet been made known who was responsible—President George Krutskoff or handsome Elmer Olsen, secretary, but never were there assembled a prettier bevy of talented girls.

As a toastmaster, Chairman Elmer Olsen can teach some of the old timers something. His address of welcome was short, emphasizing the association's motto "An equitable profit on all work we undertake to perform."

President George Krutskoff mentioned the good fellowship, friendship and sociability of this group of competing contractors. All the officers of the Association, Mrs. Albert J. Wagner, president of the Ladies' Auxiliary, and Mrs. Etta Cohn of AMERICAN ARTISAN were formally introduced with a warning not to say anything. Messrs. Rodrique and Burke, both silver-tongued attorneys, and Mr. Marshman, government counselor, were allowed 20 words each.

It was a merry crowd, fun every minute of the time and at midnight supper was served and the dancing started all over again.

## Pennsylvania Assn. Announces Program

Following are the highlights of the program announced by the Sheet Metal Contractors Association of Pennsylvania. The convention will be held in Johnstown on March 9, 10 and 11.

The morning session on Monday will allow time for registration, address of welcome by the mayor of Johnstown, appointment of the various committees and the report of the President.

The first address of the convention will be given by Charles W. Appel, President of the Distributors and Salesman's Auxiliary. The Secretary and

Treasurer will also report at this time.

Monday afternoon will be devoted to reports of the Vocational Education, Trade Relation, By-Laws, Legislative committees and an address by Edwin A. Scott of Sheet Metal Worker Magazine.

There will be three important addresses Tuesday morning—Report of Overhead Expense Committee by R. S. Hahn, Your Business Records by F. C. Park and Cost and Estimating by Louis Luckhardt.

On Tuesday afternoon Charles I. Ray, President of the National Association of Sheet Metal Contractors and D. M. Strickland of Armco will deliver addresses.

W. C. Markle, Secretary of the National Association of Sheet Metal Contractors will talk on "What Can We Do About It?" and J. C. Miles will talk on "Air Conditioning," on Wednesday morning.

The annual banquet will be held Tuesday evening in the Capital Hotel.

## Joint Conference at Cleveland, January 26

The Joint Conference meeting of the three National Organizations—National Association of Sheet Metal Contractors, United Roofing Contractors' Association, and Roofing Contractors' Division of N. S. A., was held in Cleveland, on January 26, 1931. The following members were present:

For the National Association of Sheet Metal Contractors:

Geo. I. Ray, President.  
W. C. Markle, Secretary.  
J. J. Hession, Jr.  
Wm. Hering.  
Frank Prieve.  
Walter Budd.

For the United Roofing Contractors' Association:

J. Boyd Griffiths, President.  
E. M. Pope, Secretary.  
J. A. Piper.  
Geo. I. Ray.  
C. F. Leary.  
L. Gould.

For the Roofing Contractors' Division of N. S. A.:

C. I. George, Chairman.  
W. H. Weenink, Secretary.  
W. H. Miller. W. W. Garthe.  
E. Limbach. W. S. Hays.

Upon motion duly carried Mr. Hays was elected Chairman of the *Roofing and Sheet Metal Industries Conference* which was then adopted as the official name of the organization. The meeting then proceeded with the election of officers and the following were elected for the year 1931:

3. The next meeting date be set for May 11 at Chicago—Congress Hotel Annex, Mr. Markle to set time convenient to his organization's meetings scheduled that day, and to notify all members of committee. A joint session of the directors of his organization and the Conference Committee will also be held that day.

The meeting went on record instructing the Chairman and Secretariat to tell manufacturers that all agreed the organizations should have stronger cooperation from them than in past, if the roofing and sheet metal industries are to progress.



Missouri Sheet Metal Contractors Association—February 24 and 25, in Hotel Statler, St. Louis, Missouri. Luke Tiernan, Jr., Secretary, 4242 West Pine Boulevard, St. Louis, Missouri.

Michigan Sheet Metal and Roofing Contractors—March 3, 4, 5, 1931, at Saginaw, Michigan. Frank E. Ederle, Secretary, Hotel Detroit, Detroit, Michigan.

Sheet Metal Contractors' Association of Pennsylvania—March 9, 10, 11, 1931, at Hender Hotel, Johnstown, Pennsylvania. M. F. Liebermann, Secretary, 1411 Merchant Street, Ambbridge, Pennsylvania.

Sheet Metal Contractors' Association of Florida—March 30-31, 1931, at Miami, Florida. G. H. Leavitt, Secretary-Treasurer, 909 Main Street, Tampa, Florida.

National Warm Air Heating Association—April 22 and 23, 1931, at Deshler-Wallick Hotel, Columbus, Ohio. Allan W. Williams, Managing Director, 3440 A. I. U. Building, Columbus, Ohio.

Joint Convention Sheet Metal Contractors' Association of Illinois and National Association Sheet Metal Contractors—May 12-15, 1931, Congress Hotel, at Chicago, Illinois. A. B. Rysdon, Secretary, Associated Sheet Metal Employers of Chicago, 350 North Clark Street, Chicago, Illinois.



# NEW ITEMS and NEWS ITEMS

## From and about the Manufacturers and Jobbers

### Wisconsin University Offers Course in Drafting

A course in sheet metal drafting has been added to the correspondence-study program of the University of Wisconsin Extension division to supply the necessary background in mathematics and drawing to enable sheet metal workers to lay out their own patterns for a job.

The new study subject giving this specialized training is conducted by R. W. Fowler, assistant professor of mechanical engineering, and is based on a text prepared in the Extension division by Ellsworth M. Longfield, formerly head of the sheet metal department of the Boston Trade school.

Because most workers enter this craft with not more than an elementary knowledge of mathematics, and few have drawing experience, they are handicapped in advancing in it until the needed technical preparation has been acquired. The extension course, according to the preliminary outline, has been prepared to help them to overcome these difficulties by providing instruction in the fundamental principles and many of the standard problems encountered in sheet metal work.

### Record Registrations for Eighth Annual Oil Burner Show

Eighty oil burner and accessories manufacturers—a record number—are expected to invade Philadelphia the week of April 13 to 18 for the Eighth Annual Convention and Oil Burner Show.

With a record year behind it, in spite of the depression, the oil burner industry is going after 1931 with enthusiasm. When the nation's home owners can be sold more oil heating equipment in a bad business year than had ever been sold before, even during the booming 1929, optimism for 1931 seems justified.

Following the 1930 plan, the show will be open to the public and will appeal to consumers. Prior to last year's experiment, when 10,000 people visited the show, exhibitions were for dealers only.

"Latest developments in the burner and accessory fields will be exhibited at the Philadelphia show," Mr. Tapp reports. "New models, incorporating mechanical improvements, recent engineering developments and new merchandis-

ing advantages will make their first appearance."

Philadelphia convention headquarters will be at the Benjamin Franklin Hotel. Show headquarters will be found just across the street in the Gimbel Building. There will be no admission charge to the show. Everyone will register and be provided with a pass good for the entire week. Members of the association will be given special registration cards for their authorized employees. Arrangements have been made with railroads for reduced fares on the certificate plan.

### Program Highlights

The convention will open Monday, April 13. The oil burner show will open at 7 P. M. that evening in the Gimbel Building. The exhibition will be open from 1:30 P. M. to 11 P. M. every day thenceforth until Saturday, April 18.

The annual meeting of the Association, for members only, will be held on Tuesday morning. A special open meeting for dealers will occupy Tuesday afternoon.

Merchandising sessions will begin Wednesday morning. Addresses by Haldeman Finnie, Vice-President and General Manager of the Timken-Detroit Company; Lionel L. Jacobs, President of Electrol of New Jersey; H. Barley, Vice-President of the Enterprise Oil Burner Company, and A. J. Fleischmann, Treasurer of the May Oil Burner Corporation, will be followed by an open forum.

On Thursday the merchandising sessions will continue when H. B. Dexter, Assistant Sales Manager of the Petroleum Heat and Power Company; J. Stowell of the National Warm Air Heating Association, and J. T. Foley, Chief Auditor of the Richfield Oil Corporation, will speak.

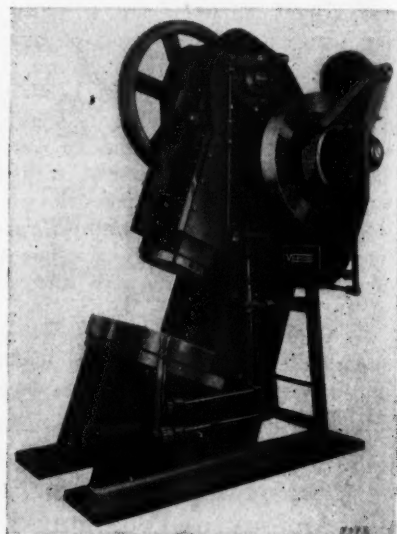
The annual banquet and dance will be held Thursday night in the Crystal Ballroom of the Benjamin Franklin.

Friday morning there will be an engineering session. Speakers will include: P. S. Russell of the Detroit Lubricator Company; J. T. McFarnahan, General Manager of the Holby Burner Corporation; Wiley Butler of the Standard Oil Company of New Jersey, and Prof. L. E. Seeley of the Sheffield Scientific School, Yale University.

### La Salle Machine Works Making Heavy Press

LaSalle Machine Works, Inc., Chicago, is now making a line of "Verson" all-steel overhanging type, permanently inclined presses. These presses are constructed of rolled steel plates of the required thicknesses cut to size and shape by the acetylene torch and arc welded into units. Ribs and supports are so placed as to provide a high degree of rigidity. When tested with a 50% overload the frame showed no appreciable amount of deflection, and no "labor" was apparent in any of the working parts.

The press illustrated is of 250 tons capacity and has an 8½-in. crankshaft, 10-in. stroke and 14-in. depth of throat. The main bearings are bronze bushed and the gibs are of steel with bronze lining. The backshaft works entirely in Timken roller bearings, and the perfectly balanced flywheel and the flywheel support are also so provided. Annular ball bearings are supplied in the pinion support.



The roller bearing, multiple disc friction clutch is equipped with an automatic safety stop designed to disengage at the top of the stroke. An auxiliary hand lever device is provided to disengage the clutch instantly at any point of the stroke.

The gibs and gibways are unusually long and the top of the ram is never out of the ways, even in this case of 10-in. stroke and 4-in. adjustment. Motor Texrope drive employing the V-belt principle is supplied.

### B. T. Land Now General Sales Manager of the King Co.

The King Company, Engineers and Manufacturers of ventilating, heating and drying systems, announce that B. T. Land has recently become identified with, and is now the General Sales Manager for the King Company of Owatonna, Minnesota.

Mr. Land has had a wide experience



in the heating and air conditioning field covering the United States and Canada.

The King Company was established 22 years ago.

Originally doing only ventilating work, in recent years they have gone into air conditioning in relation to heating, cooling, drying and humidifying, specializing principally in Food Products Plants. They are both Engineers and Manufacturers, producing all their equipment.

Extensive expansion plans have been laid by Mr. Land for 1931, with the largest annual advertising appropriation in the company's history, and the sales organization will be doubled in field men representing the company.

### Frank E. Wheeler, President International Heater Co., Dies

Frank E. Wheeler, president of the International Heater Company from its organization and a leader in manufacturing and banking circles in this city for many years, died at his home, Tuesday, February 17, after an illness of a fortnight.

In 1877 he became a partner of his father, Russel Wheeler, in the foundry on Columbia street, and the firm became Russel Wheeler & Son.

In 1898 the business was sold to the International Heater Company, formed with four other concerns, the Kernan Furnace Company, the Carton Furnace

Company of Utica, the Howard Furnace Company and the J. F. Pease Furnace Company, Syracuse.

He leaves a daughter, Mabel A., Utica; two sons, Russel, Utica, and Cortlandt Stuyvesant, London, England; and three grandsons, Russell, Jr., Murray and Millar, Utica.

### C. A. Olsen Elected President of the Fox Furnace Company

At the recent meeting of the Board of Directors, C. A. Olsen succeeded W. H. Hill as President of the Fox Furnace Company, Elyria, Ohio. Mr. Hill has been made Chairman of the Board and will, in the future, make his headquarters in New York City.

The new president is well known in the furnace industry. He has played an active part in the affairs of the National Warm Air Heating Association and the Furnace Institute.

The Fox Furnace Company is a division of the American Radiator & Standard Sanitary Corporation. They manufacture cast iron and steel furnaces, gas furnaces, air conditioning units and circulating heaters.

### Silent Automatic Conducts School

Realizing that a technically trained oil burner man is essential to the success of each dealer's organization, the Silent Automatic Corporation, Detroit, conducts in its plant a school that gives a six-day course which embraces practically everything ranging from theory of combustion to installation and service work in the field. Directing this educational enterprise is J. A. Harris, a graduate chemical engineer from the Rensselaer Polytechnic Institute, Troy, New York, with years of experience in the industrial field. The school occupies half of the sixth floor of the plant at Detroit.

Physics and chemistry of combustion, fundamentals of heating systems, mechanical analysis of oil burners, fundamentals of oil burning, installation and service of oil burners, installation and service of burner controls, installation of tanks and piping, fire adjustment and inspection, service problems and the organization of a service and installation department for the dealer are in this course.

### Minneapolis-Honeywell Absorbs Time-O-Stat

Pending ratification by stockholders of the respective corporations the Minneapolis-Honeywell Regulator Company will acquire all the assets and business of the Time-O-Stat Controls Corporation, the latter organization to be operated as a

division of the Minneapolis Company.

All items in the enlarged Minneapolis-Honeywell line of devices will be made to complement each other, thus simplifying for all users, dealers, and manufacturers the understanding and employment of automatic temperature controls.

The Minneapolis-Honeywell line will now comprise the Time-O-Stat gas hot-water heater control, mercury tube switch devices, refrigeration controls, and electric sign flashers, in addition to its former line of damper regulators, controls for oil or gas burners, unit heater and sectional controls, stoker controls, individual radiator controls, and motorized valves and controllers for industrial processes.

### F. C. Engelhart Elected President Kester Solder

At a meeting of the Board of Directors of the Kester Solder Company, Chicago, on February 17, F. C. Engelhart was elected President of the company.

Mr. Engelhart has been the directing



head of the company for twenty years, acting in the position of General Manager and Treasurer. Under his guidance the company has grown from a small organization to the present large and complete plant at 4201 Wrightwood, Chicago and with also a plant in Newark, New Jersey.

It is further announced that J. A. Reitzel, formerly Sales Promotion Manager, has been elected to the position of General Sales Manager. Mr. Reitzel has had a broad experience in sales and advertising, having occupied positions with the Portland Cement Association and other well known organizations.

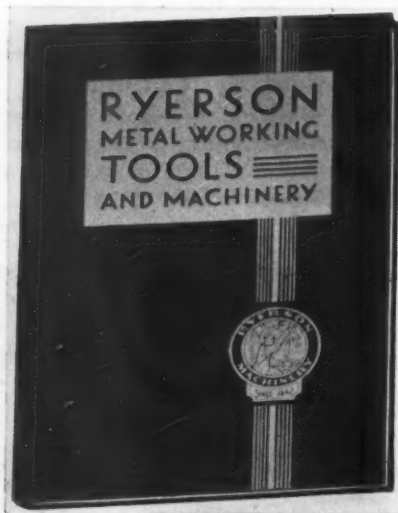
The Kester Solder Company manufactures Kester Metal Mender, Acid-Core Solder, Radio Solder, Rosin-Core Solder, Paste-Core Solder, Body Solder and Bar Solder.



### Thousands of Items Are Described in New Ryerson Catalog

A unique catalog published recently by Joseph T. Ryerson & Son, Inc., includes practically every type of tool and portable machinery used in the metal working field. Unlike most catalogs of this nature, all supplies are omitted, the book being devoted entirely to equipment for manufacturers, job shops and contractors.

In addition to the description of general equipment for all shops, a special section describes equipment for the sheet metal or tin shop.



Everything required for working sheet metal, including brakes, folders, rolls, shears, snips and stakes, punches, rotary machines, and groovers.

All of this material has been condensed into a single volume of 158 pages, a convenient size for reference purposes. The book was published primarily for the convenience of small tool and machinery buyers, but the Ryerson company reports that a number of universities have requested copies for use in connection with their technical courses.

### Revere Copper Mailing New Catalogue

A new Revere catalogue, designed by a buyer for buyers, is now ready. The catalogue gives maximum information with minimum effort. The features of the catalogue are:

1. While of convenient pocket size, one page carries the information of 3 or 4 pages of the usual metal price books.
2. By knowing the form in which you want the metal—whether sheets, rods, or tubes, etc., the whole story will generally be found on two facing pages.

Anyone interested may get a copy by addressing Revere Copper and Brass, Inc., Rome, N. Y.

### New Degree-Day Handbook

Heating and Ventilating Magazine, 521 Fifth Ave., New York, are now selling a new Heating and Ventilating DEGREE DAY HANDBOOK. The sales price of the book is \$1.50. We hope you will find it worthy of a comprehensive review in your columns.

Through the use of the data presented in this handbook, the degree-day can be applied to all problems involving the amount of fuel used for the heating of buildings. The tables give the number of degree-days for 1,000 cities by months. Individual charts devoted to coal gas, and oil, each give the data required to quickly complete the quantities for any locality.

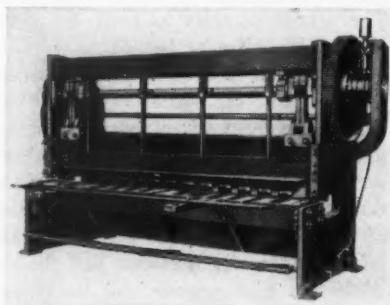
This pocket guide also contains complete data on the new Industry Degree-Day unit, designed for estimating the fuel consumption of buildings in which the inside temperature is maintained lower than 70 deg. F.

In addition to the tables of degree-days, there are state maps, showing the lines of constant degree-day loads, as well as National map showing similar information.

### Dreis & Krump Making New Large Shear

Dreis & Krump Manufacturing Co. are now ready to market a new large-sized shear which incorporates the latest developments in arc welded steel plate construction. The entire machine is built of steel plates welded into a solid unit. The bed and top leaf have welded cross bracing and the housing has a welded reinforcement around the gap. The gears are also made of rolled steel sections and welded.

These machines are to be furnished in sizes from 36 in. to 168 in. in length and



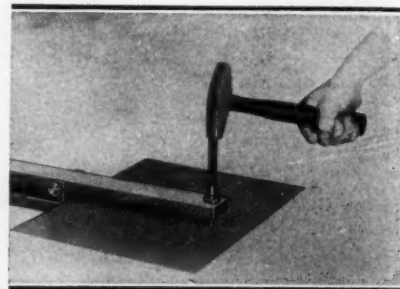
from 14 gauge to 1 in. capacity. On account of the steel construction the weights are approximately 75% of cast iron shears of the same capacity. The lubrication is by centralized system to all moving parts; hold-down is so constructed that full pressure is applied before the knives start to cut. Clutch is positive jaw type.

Literature describing these machines will be sent to anyone interested.

### Whitney Mfg. Co. Adds Hammer Punch to Line

The W. A. Whitney Mfg. Co., Rockford, Ill., have recently added to their line of sheet metal working tools a new Hammer Punch.

The tool is made of rectangular bar steel. The upper piece has a hardened and ground punch guide through which the punch itself enters making perfect alignment between the punch and the threaded die in the lower bar. The tool lies flat on the bench and by striking the



punch a blow with the hammer, a much cleaner hole is made, with no bur or distortion. The punch and die are located in the front of the tool so that an unobtrusive view of the work is obtained.

The rated capacity of the tool is 7/16-inch hole through 1/16-inch metal. Stock size punches are from 1/8 inch to 7/16 inch by 1/32 inch. The depth of throat is 18 inches so that holes can be made in the center of sheets 36 inches in width.

These tools are carried in stock by jobbers throughout the United States and Canada, and additional information can be obtained from your jobber or direct from the manufacturer.

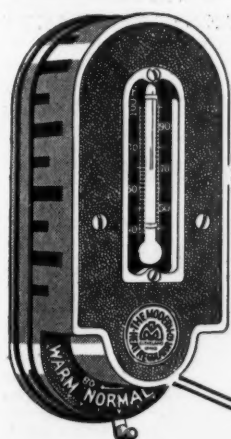
### New Light Steel Framing to Take Place of Lumber

To meet the growing demand for light steel construction, William O. Sheldon of 1475 Clarence Ave., Lakewood, Ohio, has invented a type of light weight "hollow steel lumber," of such shape and construction as to readily supplant the ordinary wooden beam, joist, studding, etc.

Sections of 2 in. by 2 in., 2 in. by 4 in., 2 in. by 6 in., 4 in. by 4 in., etc., can be made from light gauge steel sheets, or strip steel, giving greater strength than wooden framing of equal dimensions, and at the same time providing an absolutely fireproof, vermin proof and practically indestructible form of light building construction.

These shapes are so formed that they can be used much the same as ordinary wooden framing has been used. All joints and connections can be spot welded together, making practically a one piece frame for a building.





## — "SENTINEL" — Heat Regulator

THE SENTINEL HEAT REGULATOR guards the health of your customer's family by automatically maintaining an even temperature in their home. The danger of over-heating is eliminated. Simply set the Thermostat at any desired temperature and the SENTINEL tends the fire. The SENTINEL provides comfort—convenience—freedom from heating worries.

Controlled automatically by a beautiful, walnut, moulded bakelite Thermostat. Operates on one degree temperature variation.

DEALER'S PRICE ON REQUEST

\$48

List-Price

Warm air furnace dealers will find that the SENTINEL will make a profit for them. It can easily and quickly be installed on any type heating plant and is fully guaranteed.

Let us tell you all about our proposition

— WRITE —

TUTTLE AND BAILEY MFG. CO.

NEW YORK CITY, N. Y.

CHICAGO, ILLINOIS

— or —

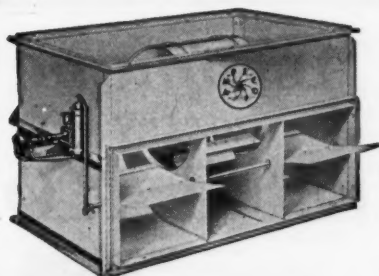
THE MODERN HEAT REGULATOR CO.

Manufacturers of MODERN and SENTINEL REGULATORS

CLEVELAND, OHIO



The low voltage Control Motor is Silent, Powerful and does not interfere with Radio.



## The ACE of All Forced Air Circulators for Your Heating Jobs

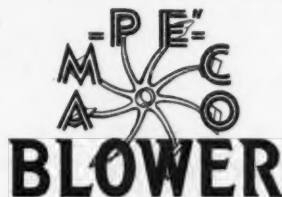
AM-PE'-CO has revolutionized air circulator construction and efficiency. The only blower that positively provides a fully balanced distribution of air to the rotor—vital to proper blower operation. Patented improvements assure positive, uniform heat delivery. Mechanically controlled; compact; quiet; non-leaking ring oil bearings. A big business builder and profit maker for the dealer.

Built with or without dampers which open automatically when the blowers stop, for gravity circulation. Get more blower business for yourself—write us for literature on Am-pe'-co Blowers, and full information.

AMERICAN MACHINE PRODUCTS COMPANY

Marshalltown, Iowa

For 15 Years Manufacturers of Precision Products



## HEAT RADIATING FINNS

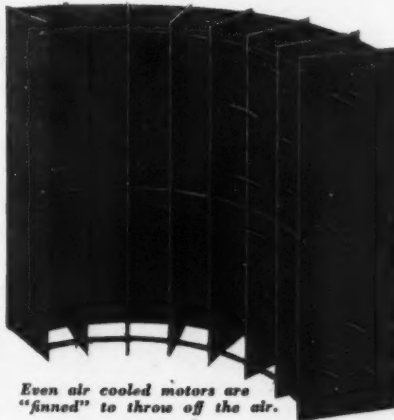
INCREASE HEATING EFFICIENCY

### EXPLAIN

#### "FINNED HEAT"

To Your Prospects

The buyer of the warm air heating unit is interested in quality, but, above all, in heating satisfaction. Show him the HALL-NEAL VICTOR—explain to him the value of a "Finned Heat" radiating system.



Even air cooled motors are "finned" to throw off the air.

You can assure him heating satisfaction and economical fuel consumption. Become a HALL-NEAL dealer.

Only HALL-NEAL  
VICTOR "BOILER PLATE" FURNACES  
Can Give

### "FINNED-HEAT" SATISFACTION

Let us tell you all about the HALL-NEAL "Finned Heat" Furnaces and about the unusual franchise offered progressive warm air heating dealers.

HALL-NEAL FURNACE COMPANY

1324 Capitol Avenue

Indianapolis, Indiana

H-N

Mention AMERICAN ARTISAN in your reply—Thank you!

## Use this Ticket on a SPECIAL JOB

Tear Out and Mail

"Chicago Metal"—I am attaching ☐ Specifications; ☐ including Blue Prints; ☐ Sketches.

Please quote me your price on the following quantity: \_\_\_\_\_ and the date you can deliver: ☐ Sample ☐ Whole Job.

☐ Send your book "Sheet Metal Products."

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

## 8 out of 10 Special Jobs Can Be Done Better at Lower Cost in our Plant



Hinged Display Case, with Latch.

Wall Cabinet, with Shelves.



There's a good reason why some of our customers quote *what it would cost them* to turn out a special sheet metal or light fabricated job, and then give the job to us and get an ample profit out of our lower price.

In our plant we have full equipment for a hundred types of jobs—and we have turned out hundreds of jobs of each type. Experience and equipment bring costs down to levels where you make a better profit.

Write us for the picture book, "Sheet Metal Products" showing some of our wide range of work. Send the coupon for a quotation on the job you are now figuring.

## CHICAGO METAL MANUFACTURING CO.

3715 South Rockwell St.

Chicago, Ill.

## RUGGED WELDED STEEL FURNACES



## X-L-ALL RUGGED WELDED STEEL FURNACE

Here's a furnace built on a background of over 59 years—a furnace scientifically assembled, with a standard code rating—a furnace with many unusual features.

## THE FURNACE WITH THE OVERSIZE COMBUSTION CHAMBER



We have an unusual profit making proposition for aggressive dealers who desire to sell and install steel furnaces which will give satisfactory heating service throughout the years.

Let the X-L-ALL booklet tell you all about the evolution of steel furnaces, proper installation and use of steel furnaces, and the Deshler unusual proposition. Write today!

DESHLER FOUNDRY & MACHINE WKS.  
140 SOUTH EAST AVENUE, DESHLER, OHIO



## Aeroplane ROTARY VENTILATOR



Write for complete catalog today

THIS is a top balanced ventilator that is free swinging, perfectly balanced and sensitive to the lowest air movements.

THE main bearing is our own patented design. Simple and absolutely reliable under all conditions. It is of special bronze on steel, non-corrosive and of the one-ball type. It is practically frictionless. The Aeroplane is a correctly designed, highly efficient well made ventilator. It is well braced, reinforced with riveted steel segments and riveted and seamed throughout. You can sell it with confidence that it will do its work well and last long.

PAUL R. JORDAN & CO.  
630 South Delaware St. Indianapolis, Ind.

Mention AMERICAN ARTISAN in your reply—Thank you!



## Makes the HARD Sales EASY . . .

### New 1000 Series "CHALLENGE"

Now a super constructed furnace that challenges all competition and stands head and shoulders over every type furnace in the moderate price range.

Makes the hard sales easy with its many unusual features such as Square-Back Ashpit—Triple Sealed Joints—Lever Shaker Handle—Greater Grate Area—Greater Heating Surface and Increased Standard Code Rating.

Make the hard sales easy—Meet all competition and Win. Write today for full information and quotations.

**STANDARD FOUNDRY & FURNACE COMPANY, DeKalb, Illinois**

*Also Manufacturers of Hero Air Washer and Titan Superheater Furnace*

## A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

Heats garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.

Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

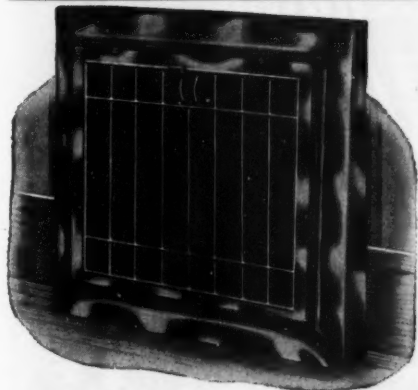
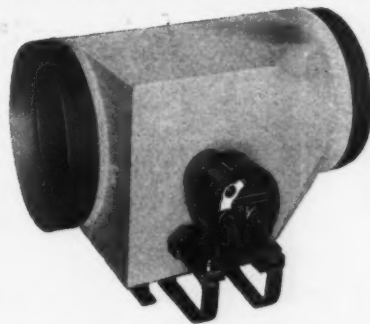
Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. CLIP AND SEND THIS AD IN NOW!

**AMERICAN FOUNDRY & FURNACE COMPANY**

Bloomington,

*World's largest manufacturers  
of blower furnace systems*

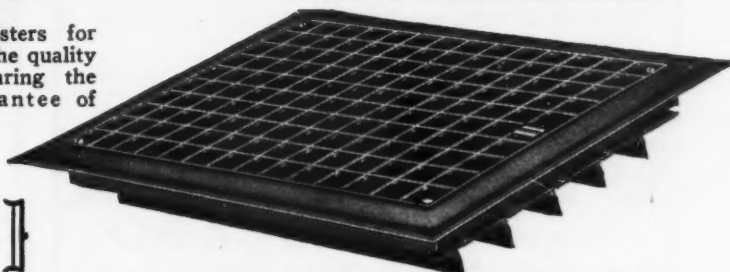
Illinois



### "NO STREAK" WALL REGISTER

Two great registers for wall or floor of the quality par-excellent bearing the name and guarantee of Rock Island.

**WRITE FOR  
THE 1931  
CATALOG**



### "MODERN" STEEL FLOOR REGISTER

**ROCK ISLAND REGISTER COMPANY, ROCK ISLAND, ILLINOIS**

*Mention AMERICAN ARTISAN in your reply—Thank you!*



**WAW**

## HERE'S THE NEW WHITNEY PUNCH

*You've Been Waiting for!*  
**No. 91 BENCH**

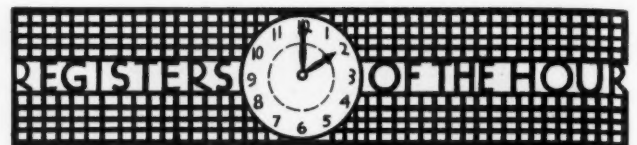
**Specifications:**  
**Capacity** —  $\frac{5}{8}$ " hole through  $\frac{1}{4}$ ";  
 1" hole through  $\frac{3}{16}$ "; 2" hole through  $\frac{1}{8}$ ".  
**Punches** from  $\frac{1}{4}$  to 2" round.  
**Strength**—All parts are heat-treated drop-forgings, except Jaw, which is a chrome-nickel steel casting.  
**Weight**—80 lbs.



Now a bench type Whitney Punch of unusual capacity, strength and range. Punches angle or channel iron—hand operated.

**A PUNCH FOR EVERY NEED**  
*Write for Catalog*  
*The Choice of OVER 50,000 Satisfied Users*

**W. A. WHITNEY MFG. COMPANY**  
 636 Race Street Rockford, Ill.



## AUER MAKES A GRILLE AND REGISTER TO MEET EVERY NEED

**AUER REGISTER COMPANY**  
 3608 Payne Avenue CLEVELAND, OHIO

## FREE

*This can of*



**If you will set ONE FURNACE!!**

WE can afford to do this because hundreds of furnace installers are adopting it in place of asbestos mud cements.

METALUTE is mostly powdered iron—you mix it with water.

Permits immediate heating. Makes a One Piece Cast Iron Furnace BUT you can take it apart.

Just Say:—Send the FREE SAMPLE of METALUTE (Plastic Iron).

100 lb. drum \$16.00—  
Gallons \$4.56 each

**TECHNICAL PRODUCTS COMPANY**

INSA-LUTE CEMENTS  ADHESIVES COMPOUNDS

Pittsburgh (STATION) Pennsylvania



## F A M O U S

for the cozy comfort of its appointments and the friendly spirit of its service, the Bismarck is Chicago's outstanding hotel for out-of-town visitors. Add to this its fame for Good Food... its most reasonable rates... its close proximity to all amusement and business centers... and you have the secret of The Bismarck's constantly growing popularity. Write for booklet with downtown map.

Rooms, \$2.50 up—With Bath, \$3.50 up

**NEW**  
**BISMARCK**  
 HOTEL CHICAGO  
 RANDOLPH AT LA SALLE

## File This Copy

When you have finished reading this issue of AMERICAN ARTISAN, pass it on to others in your organization, marking the articles in which they should be particularly interested.

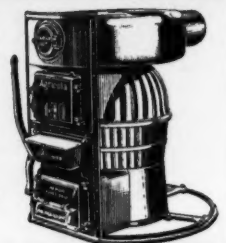
Then file it for future reference. You never know when you will encounter a problem in your business that is covered in this very issue.

## Genuine Agricola

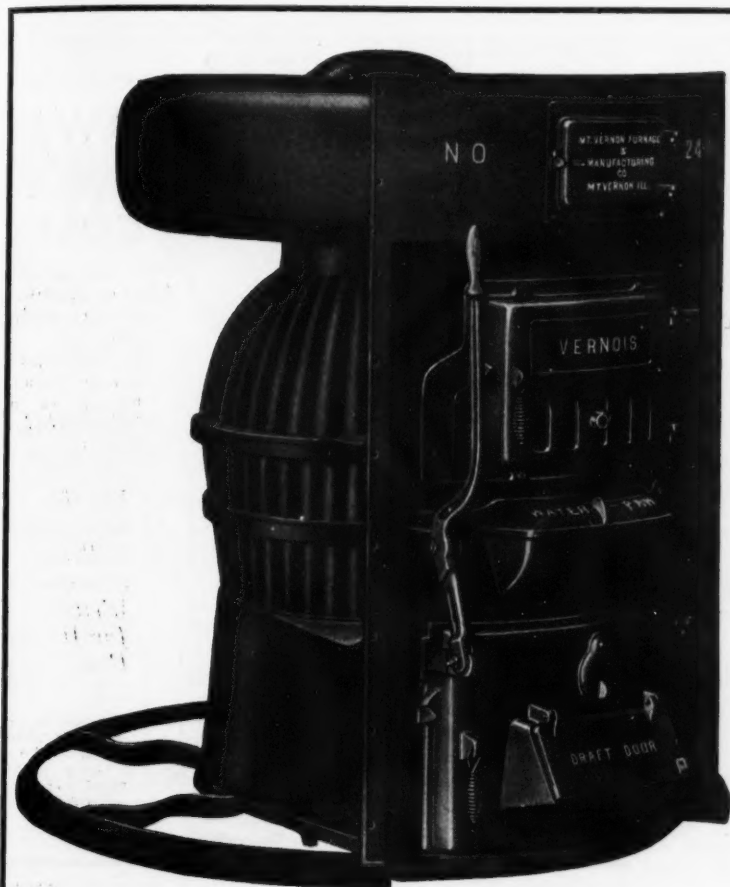
### REPAIR PARTS

To be sure of perfect fitting castings and parts, order only genuine AGRICOLA Repair Parts. Prompt shipments.

**AGRICOLA FURNACE CO., Inc.**  
 Gadsden, Alabama  
 Offices in principal cities



Mention AMERICAN ARTISAN in your reply—Thank you!



## New **Vernois** Prices

*are now being mailed  
to the trade*

VERNOIS Furnaces have stood the test. Their dependability is proven.

Firepot sizes 18" to 30".

If you have not received your copy of the new price sheet, write for it at once.

The VERNOIS Agency will be a profitable one for you.

**MT. VERNON FURNACE & MFG.  
COMPANY**

Mt. Vernon

Illinois



## "Do it for the last time with COPPER"

is the title of this new selling help prepared by The American Brass Co. to help contractors secure more Anaconda Copper jobs. This folder, and others like it, are supplied free of charge and in reasonable quantities to contractors using Anaconda Copper—specially imprinted with their firm names and addresses. Write today for a supply. The American Brass Co., General Offices: Waterbury, Conn.

**ANACONDA COPPER**

## NEW! The H & C Cabinet Register

*Ideal for Old House Installations*

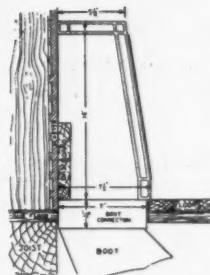
Class No. 180



**Requires  
No Cutting  
of Beams,  
Joists or  
Partitions**

Register sets outside of partition against the wall. Boot attaches directly to register—no other fittings required. Back is integral with body, insuring positive streak-proof installation.

Made in one size only—10x13 face. Air capacity 107". Projection at base 7½". Overall width 16". Boot size 7x13. Packed in individual cartons. Available in Oak grain and six other standard finishes.



See them at your jobber. Write us if he doesn't as yet stock them.

**HART & COOLEY MFG. COMPANY**  
General Sales Offices—61 West Kinzie St., Chicago

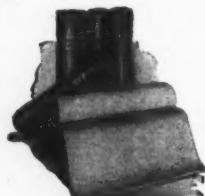
Mention AMERICAN ARTISAN in your reply—Thank you!



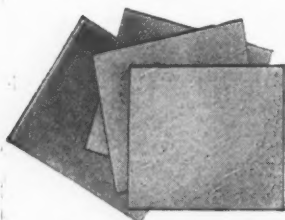
## Keep All the Heat Up in the House

UP in the house is where your customers want the heat—not in the basement.

You can greatly improve the appearance and increase the efficiency of your warm air furnace installations by covering the pipes and casing with **Corrugated Asbestos Paper**—a flexible insulation material especially suited for wrapping furnace pipes.



**Asbestos Paper**  
8-10-12-14-16-32 lbs. per 100 square feet.  
18" and 36" wide—50 or 100 lb. Rolls.



**Asbestos Mill Board**  
1/8-3/4-1/2" thick in sheets  
42x48



**Corrugated Asbestos Board**  
A flexible insulation 1/4, 1/6 or 3/4 inch thick. Especially adapted for wrapping furnace pipes.

*You can add to your profits and increase customer satisfaction with Standard Asbestos Products*

### STANDARD ASBESTOS MANUFACTURING CO.

OF CHICAGO

820 WEST LAKE ST., CHICAGO

MARSHALLTOWN



SHEARS

## LET MARSHALLTOWN SHEARS CUT YOUR LABOR COSTS



Put the right kind of machine on the right job. Save time and labor costs. Make it a **MARSHALLTOWN**.

*Let the Catalogue Tell the Story—Write for It Now*

*The Shear Keeps Sharp Even After Months of Hard Use*

There is a **MARSHALLTOWN** for every use. Hand—Motor—and Belt Power.

MARSHALLTOWN MFG. CO.

MARSHALLTOWN IOWA

## The New Type of Shear!

*With the Strength of the Giant Gear—Compound Leverage*

## The ECONOMY SHEAR

*Adapted to Any Class of Work*



ROLLERS

FOOT-HOLD

These are two exclusive features of the **GIANT ECONOMY GEAR-COMPOUND SHEARS**.—Rollers facilitate labor and save time in pushing shears about the floor when large sheets of metal are being cut.—Foot-hold permits the stationary arm of shears to be pressed firmly to the floor.

The Shear frame is made of malleable iron.—The length of blade is 10 inches.

*Write today for complete information*

**MAS-CHEK MANUFACTURING CO.**

1400 West Ohio Street

Chicago, Ill.

*Mention AMERICAN ARTISAN in your reply—Thank you!*



**NOW PACKED  
IN CARTONS**

**1/2 GROSS  
TO THE  
CARTON**



**A FINE DAMPER**  
**Attractively Priced**

**FORMERLY** sold under the trade name "STAR," this steel damper has been very popular for years. It is exceptionally well made. Handle enters either side of disc. Furnished in 6", 7", 8", 8 1/2", 9", 10", 12" and 14" sizes.

*Samples and prices on request*

**STURDY—ECONOMICAL**  
**No-Rivet Clips and Tips**  
Made of heavy gauge steel. Prongs provide quick and secure means of fastening to disc without rivets. Also punched with rivet holes.



No 101 Clip



No 102 Clip

*It pays to standardize on the H & C line of  
Quality Furnace Accessories*

**HART & COOLEY MFG. CO.**  
*Successors to Federal Mfg. Company*  
SALES OFFICES:  
Chicago, 61 W. Kinzie St.; Philadelphia, 1600 Arch St.; New York, 101 Park Ave.; Boston, 75 Portland St.; New Britain, Nashua, N. H.—FACTORY AT HOLLAND MICHIGAN

## The Viking Shear

Compound lever handle—removable blades. Upper blade away from mechanic enabling easy following of work—an exclusive Viking feature.



*Sold Under a Guarantee—Send for Particulars*

**VIKING SHEAR CO., Erie, Pa.**

### A NEW IDEA IN AIR CLEANING

**T**HE Kleenaire Furnace Filter is extremely simple yet efficient and does not obstruct the free passage of air even when the dust arresting element is entirely covered with dust. The dust collecting surfaces (dry) are arranged in a zig-zag formation so that the air impinges upon them, depositing its dust.



Made in two sizes—  
16"x24" and 20"x20"

#### KLEENAIRE Furnace Filters

are easily installed and are cleaned by placing under hot water faucet. Nothing to renew—nothing to replace. Permanently efficient and won't impair movement of air. Write for details on new 1931 models.

**KLEENAIRE  
Filter Company**  
STEVENS POINT, WIS.

Mention AMERICAN ARTISAN in your reply—Thank you!



(Trade Mark)

## THE NEW GRILLE CONSTRUCTION

*Beautiful—Convenient—Economical*





"Grilframe" parts ready for assembly (Front view)

**"GRILFRAME"**  
is completely assembled from stock parts. This new method makes possible 48 hour service.

Distributors are being appointed in principal cities

**SEND FOR CATALOG**



Grille secured to frame with lug (Back view)

### H & K GRILLES

**H** & K grilles are well known throughout the country and for excellence of workmanship and beauty of design are not surpassed. Grilframe construction is adapted to all of H & K grille designs and rounds out the line of our punched metal grilles. Ask for catalog No. 28.

### PERFORATED METAL

**E**VERY type of perforated metal from the finest to the largest standard sizes are within the scope of our equipment. This means round, oblong, slot, square holes and many special shapes suitable for metal of different kinds and thicknesses.

*Write us for perforated metal  
of every sort*

### THE HARRINGTON & KING PERFORATING COMPANY

5649 Fillmore Street      Chicago, Ill.  
New York Office: 114 Liberty Street

# ~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

## METALS

### PIG IRON

Chicago Fdy., No. 2	\$17.50
Southern Fdy. No. 2	\$17.01 to 17.51
Lake Superior Charcoal	27.04
Malleable	17.50

### FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC 20x28 112 sheets	\$22.50
IX 20x28	26.50
IXX 20x28 56 sheets	26.50
IXXX 20x28	14.50
IXXXX 20x28	15.50
IXXXX 20x28	17.00

### TERNE PLATES

IC 20x28, 40-lb. 112 sheets	\$24.00
IX 20x28, 40-lb. 112 sheets	26.50
IX 20x28, 40-lb. 112 sheets	26.50
IX 20x28, 25-lb. 112 sheets	23.50
IX 20x28, 20-lb. 112 sheets	19.00
IX 20x28, 20-lb. 112 sheets	22.00

### "ARMCO" INGOT IRON PLATES

No. 8 ga.—110 lbs.	\$4.15
1/16 in.—100 lbs.	4.05
1/8 in.—100 lbs.	3.85

### COKE PLATES

Cokes, 80 lbs., base, 20x28	\$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, IC	
20x28	12.75
Cokes, 135 lbs., base, IX	
20x28	14.75
Cokes, 155 lbs., base, 2X	
56 sheets	8.50
Cokes, 175 lbs., base, 3X	
56 sheets	9.35
Cokes, 195 lbs., base, 4X	
56 sheets	10.25

### BLUE ANNEALED SHEETS

Base 10 ga.—per 100 lbs.	\$3.35
"Armco" 10 ga.—per 100 lbs.	4.15

### ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs. \$3.75
No. 22	per 100 lbs. 3.70
No. 24	per 100 lbs. 3.75
No. 26	per 100 lbs. 3.85
No. 27	per 100 lbs. 3.90
No. 28	per 100 lbs. 4.00

### GALVANIZED

No. 16	per 100 lbs. \$3.85
No. 18	per 100 lbs. 3.95
No. 20	per 100 lbs. 4.15
No. 22	per 100 lbs. 4.20
(Standard differentials on extras to apply)	
No. 24	per 100 lbs. \$4.35
No. 26	per 100 lbs. 4.60
No. 27	per 100 lbs. 4.70
No. 28	per 100 lbs. 4.85
"Armco" 24	per 100 lbs. 5.95

### BAR SOLDER

Warranted 50-50	per 100 lbs. \$13.00
45-55	per 100 lbs. 17.00
48-52	per 100 lbs. 17.75
Plumbers'	per 100 lbs. 15.50

### ZINC

In Slabs	\$5.00
----------	--------

### SHEET ZINC

Cask Lots (600 lbs.)	\$12.00
Sheet Lots (100 lbs.)	13.00

### BRASS

Sheets, Chicago base	17% c
Tubing, brazed, Chicago base	24% c
Tubing, seamless, Chicago base	22% c
Wire, Chicago base	17% c
Rods, Chicago base	15% c

## COPPER

Sheets, Chicago base	20c
Tubing seamless, Chicago base	22% c
Wire, plain rd., 8 B. & S. Ga. and heavier	12% c

## LEAD

American Pig	\$9.00
Bar	7.50

## TIN

Bar Tin	per 100 lbs. \$32.00
Pig Tin	per 100 lbs. \$1.00

## SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

## ASBESTOS

Paper up to 1/16	5c per lb.
Roll board 3/32 to 1/8	5 1/2 c per lb.
Mill board 1/8 to 1/4	5 1/2 c per lb.
Corrugated paper (250 sq. ft. per roll)	\$4.00 per roll

## ASBESTOS SEGMENTS

8 in.	per 25 sets \$1.85
9 in.	per 25 sets 2.10
10 in.	per 25 sets 2.35
12 in.	per 25 sets 2.65

## CEMENT FURNACE

5-lb. cans, net	\$0.40
10-lb. cans, net	0.80
25-lb. cans, net	2.00
Per 100 lbs.	7.50

## CLIPS

Damper	
No-Rivet Steel, with tail pieces	\$9.50
Rivet Steel, with tail pieces	7.50
per gross	7.50
Tail pieces, per gross	2.40

## COPPER FOOTING

Copper Footing	41%
----------------	-----

## CORNICE BRAKES

Chicago Steel Bending	
No. 1 to 6B	Not

## CUT-OFFS

Cal., plain, round or cor. rd.	
26 gauge	30%
28 gauge	35%

## DAMPERS

Yankee Warm Air	
7 inch, doz.	\$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

## EAVES TROUGH

Galv. Crimpedge, crated	75-15%
Zinc	60%

## ELBOWS

Conductor Pipe	
Galv. plain or corrugated, round flat Crimp.	
28 gauge	60-10%
26 gauge	60%
24 gauge	15%

Galv. Terne Steel	
Plain Rd. and Rd. Corr.	
28 gauge	60-10%
26 gauge	60%
24 gauge	15%

## Square Corrugated

28 gauge	55%
26 gauge	40%

## Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.	
Not nested	70 & 5%
Nested solid	70 & 5%

## Sq. Corr., A. & B. & Octagon

28 gauge	55%
26 gauge	40%

## Portico

1, 1 1/4, 1 1/2 inch	45%
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## Copper

16 oz. all designs	50%
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## Zinc

All styles	60%
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## ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue	
No. 28 Gauge.	Doz.
5 inch	\$1.15
6 inch	1.25
7 inch	1.75

## Adjustable—Uniform Blue

No. 28 Gauge, Uniform Blue.	
5 inch	\$1.60
6 inch	1.75
7 inch	2.10

## WOOD FACES—60% off list.

## FIRE POTS

No. 02 Gasoline Torch, 1 qt.	\$5.13
No. 0250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

## GLASS

Single and Double Strength, A, all brackets	85%
Single and Double Strength, B, all brackets	87%

## HANGERS

Conductor Pipe	
Milcor Perfection Wire	25%
Milcor Triplex Wire	10%

Eaves Trough	
Steel (galv. after forming) from list	45%
Sellock E. T. Wire, List	10%

## HOOKS

Conductor	
"Direct Drive" Wrought Iron for wood or brick	15%

## MITRES

Galvanized Steel Mitres	
28 gauge	70
26 gauge	60-20

## PASTE

### Asbestos Dry Paste

200-lb. barrel	\$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

## PIPE

### Galvanized

Crated and nested (all gauges)	75-12 1/2%
Crated and not nested (all gauges)	75-7 1/2%

### Furnace Pipe

Double Wall Pipe and Fittings	60%
Single Wall Pipe, Round Galvanized Pipe	60%
Galvanized and Tin Fittings	60%

## Lead

Per 100 lbs.	\$12.50
Stove Pipe	
"Milcor" "Titelock" Uniform Blue	
28 gauge, 5 inch U. C.	
nested	\$10.00
28 gauge, 6 inch U. C.	
nested	11.00
28 gauge, 7 inch U. C.	
nested	13.00
30 gauge, 5 inch U. C.	
nested	9.25
30 gauge, 6 inch U. C.	
nested	10.00
30 gauge, 7 inch U. C.	
nested	12.00

### T-Joint Made Up

6 inch, 28 ga.—per doz.	\$3.40
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## REGISTERS AND FACES

### Floor Registers

Steel and Semi-Steel	40 & 10%
All Cast Iron	20%

### Baseboard

2-Piece	40 & 10%
1-Piece	40-10 & 20%

### Adjustable Ventilators

Adjustable Ventilators	40 & 10%
------------------------	----------

## COLD AIR FACES

Steel and Cast, less than 14" width	40 & 10%
Steel, 14" and wider	65 & 10%
Cast, 14" and wider	60 & 10%
Special Cold Air Faces, Steel or Cast	40 & 10%

## RIDGE ROLL

Galv. Plain Ridge Roll, b'd'd	75-15-5%
Galv., Plain Ridge Roll, crated	75-15%

## SCREWS

Sheet Metal	
7, 1/2 x 1/4, per gross	\$0.52
No. 10, 1/2 x 1/4, per gross	0.65
No. 14, 1/2 x 1/4, per gross	0.55

## SHEARS, TINNERS' AND MACHINISTS'

Viking	\$22.00
--------	---------

### Lennox Throatless

No. 18	35%
Shear blades	10%
(f. o. b. Marshalltown, Iowa.)	

## SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60%
26 gauge, round flat crimp	50%
24 gauge, round flat crimp	15%

## SNIPS

Tinner's	Not
----------	-----

## VENTILATORS

Standard	30 to 40%
Milcor	Not

## SPEAKING OF SHEET METALS

— *The Never-Rust and the Non-Corrosive Kinds* —

It will be difficult to find sheets more practical or up-to-date than the following which we carry in stock.

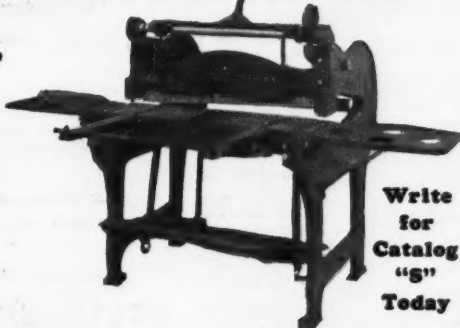
ENDURO K. A. 2 STAINLESS IRON  
ANACONDA COPPER—FAIRMONT ALUMINUM  
HORSE HEAD AND NICKELLED ZINC

THE J. M. & L. A.  
**OSBORN CO**  
MANUFACTURERS—DISTRIBUTORS  
DETROIT-CLEVELAND-BUFFALO

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SQUARES,  
TRIMS  
AND  
SLITS

all sheets  
14 gauge  
or  
lighter



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on All Warm  
Air Heating Supplies

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and Supplies

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& Black  
Anaconda Copper  
Toncan Iron

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STEEL  
SERVICE

ROCKFORD SHEET STEEL CO.  
Rockford, Illinois

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## SHEETS

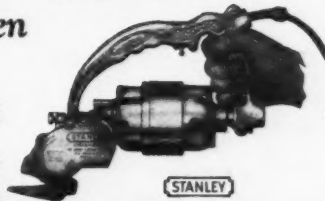
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of sheet materials of every  
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With a cutting speed of 15 feet  
per minute this tool increases  
the earning power and saves the  
energy of the men who use it.

It has a capacity of No. 18  
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New Britain, Conn.

### STANLEY ELECTRIC TOOLS

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# BUYERS' DIRECTORY

## Air Cleaners

American Fdy. & Furnace Co.,  
Bloomington, Ill.  
Independent Air Filter Co.,  
Chicago, Ill.  
Kleenaire Filter Co.,  
Stevens Point, Wis.  
Meyer & Bro. Co., F.,  
Peoria, Ill.  
Watt Mfg. Co.,  
Sterling, Ill.

## Air Washers

A. Gehrl & Co., Tacoma, Wash.  
Watt Mfg. Co., Sterling, Ill.

## Aluminum Sheets

J. M. & L. A. Osborn Co.,  
Cleveland, Ohio

## Asbestos—Liquid

Technical Products Co., Pittsburgh, Pa.

## Asbestos Paper

Wilson, Grant, Inc., Chicago, Ill.

## Blast Gates

Berger Bros. Co., Philadelphia, Pa.

## Blowers—Furnace

American Fdy. & Furnace Co.,  
Bloomington, Ill.  
American Machine Products Co.,  
Marshalltown, Iowa.  
A. Gehrl & Co., Tacoma, Wash.  
Brundage Co., Kalamazoo, Mich.  
Lakeside Co., Hermansville, Mich.  
Watt Mfg. Co., Sterling, Ill.

## Bolts—Stove

Lamson & Sessions Co.,  
Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.

## Brakes—Bending

Drele & Krump Mfg. Co., Chicago, Ill.  
Interstate Machinery Co., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
Peck, Stow & Wilcox Co.,  
Southington, Conn.

## Brakes—Cornice

Drele & Krump Mfg. Co., Chicago, Ill.

## Brass and Copper

American Brass Co., Waterbury, Conn.  
Copper & Brass Research Association,  
New York, N. Y.

## Cans—Garbage

Diener Mfg. Co., G. W., Chicago, Ill.  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio

## Castings—Malleable

Fanner Mfg. Co., Cleveland, Ohio

## Ceilings—Metal

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Chaplets

Fanner Mfg. Co., Cleveland, Ohio

## Cleaners—Vacuum

Brillon Furnace Co., Brillon, Wis.  
National Super Service Co.,  
Toledo, Ohio

## Copper

American Brass Co., Waterbury, Conn.  
Rockford Sheet Steel Co.,  
Rockford, Ill.

## Cornices

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Cut-offs—Rain Water

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Dampers—Quadrants—Accessories

Aeolus Dickinson, Chicago, Ill.  
Hart & Cooley Co., Holland, Mich.  
Howes Co., S. M., Boston, Mass.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Parker-Kalon Corp., New York, N. Y.

## Dampproofings

Lastik Products Corp., Pittsburgh, Pa.

## Damper Regulators

Sheer Co., H. M., Quincy, Ill.

## Diffuser—Air Duct

Aeolus Dickinson, Chicago, Ill.

## Drills—Electric

Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
J. M. & L. A. Osborn Co.,  
Cleveland, Ohio  
The Stanley Electric Tool Co.,  
New Britain, Conn.

Drive Screws—Hardened Metallic  
Parker-Kalon Corp.,  
190 Varick St., New York

## Eaves Trough

Barnes Metal Products Co.,  
Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Chase Brass & Copper Co.,  
Waterbury, Conn.  
Chicago Metal Mfg. Co., Chicago, Ill.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Rockford Sheet Steel Co.,  
Rockford, Ill.

## Elbows and Shoes—Conductor

Apex Gutter Hanger Corp.,  
New York, N. Y.  
Barnes Metal Products Co.,  
Chicago, Ill.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Rockford Sheet Steel Co.,  
Rockford, Ill.

## Filters—Furnace

Independent Air Filter Co.,  
Chicago, Ill.  
Kleenaire Filter Co.,  
Stevens Point, Wis.

## Fittings—Conductor

Barnes Metal Products Co.,  
Chicago, Ill.  
Braden Mfg. Co., Terre Haute, Ind.  
Chicago Metal Mfg. Co., Chicago, Ill.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Chicago Metal Mfg. Co., Chicago, Ill.

## Fluxes—Soldering

Kester Soldering Co., Chicago, Ill.

## Furnace Cement

Connors Paint Mfg. Co., Wm.,  
Troy, N. Y.  
Lastik Products Corp., Pittsburgh, Pa.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Technical Products Co., Pittsburgh, Pa.

## Furnace Chain

Hart & Cooley Co., Holland, Mich.

## Furnace Cleaners—Suction

Brillon Furnace Co., Brillon, Wis.  
National Super Service Co.,  
Toledo, Ohio

## Furnace Fans

A-C Mfg. Co., Pontiac, Ill.  
American Fdy. & Furnace Co.,  
Bloomington, Ill.  
Brundage Co., The, Kalamazoo, Mich.  
Lakeside Co., Hermansville, Mich.  
Robinson Co., A. H., Massillon, Ohio  
Watt Mfg. Co., Sterling, Ill.

## Furnace Filters

Independent Air Filter Co.,  
Chicago, Ill.  
Kleenaire Filter Co.,  
Stevens Point, Wis.

## Furnace Pokers

Fanner Mfg. Co., Cleveland, Ohio

## Furnace Pulleys

Hart & Cooley Co., Holland, Mich.

## Furnace Regulators

Minneapolis-Honeywell Regulator  
Co., Minneapolis, Minn.  
Noll Regulator Co., Youngstown, Ohio  
Sheer Co., H. M., Quincy, Ill.  
White Mfg. Co., Minneapolis, Minn.

## Furnace Rings

Forest City-Walworth Run  
Foundries Co., Cleveland, Ohio

## Furnaces—Gas

Calkins & Pearce, Columbus, Ohio  
Lennox Furnace Co.,  
Marshalltown, Iowa  
Robinson Co., A. H., Massillon, Ohio  
Rudy Furnace Co., Dowagiac, Mich.  
Wise Furnace Co., Akron, Ohio

## Furnaces—Oil Burning

Motor Wheel Corp., Heater Div.,  
Lansing, Mich.

## Furnaces—Warm Air

Agricola Furnace Co., Gadsden, Ala.  
American Fdy. & Furnace Co.,  
Bloomington, Ill.  
American Furnace Co., St. Louis, Mo.  
The Beckwith Co., Dowagiac, Mich.  
Brillon Furnace Co., Brillon, Wis.  
Deshler Foundry & Machine Works,  
Deshler, Ohio  
Enterprise Boiler & Tank Works,  
Chicago, Ill.  
Forest City-Walworth Run Fdy.,  
Cleveland, Ohio  
Fox Furnace Co.,  
Elyria, Ohio  
Hall-Neal Furnace Co.,  
Indianapolis, Ind.  
Henry Furnace & Fdy. Co.,  
Cleveland, Ohio  
London Furnace Co., London, Ohio  
Lennox Furnace Co.,  
Marshalltown, Iowa  
May Flebager Furnace Co.,  
Syracuse, N. Y.  
Meyer Furnace Co., The, Peoria, Ill.  
Midland Furnace Co., Columbus, Ohio  
Motor Wheel Corp., Heater Div.,  
Lansing, Mich.  
Mt. Vernon Furnace & Mfg. Co.,  
Mt. Vernon, Ill.  
Peerless Foundry Co.,  
Indianapolis, Ind.  
Premier Warm Air Heater Co.,  
Dowagiac, Mich.  
Rybolt Heater Co.,  
Ashland, Ohio  
Rudy Furnace Co., Dowagiac, Mich.  
Schwab Furnace & Mfg. Co.,  
Milwaukee, Wis.  
Standard Fdy. & Furnace Co.,  
De Kalb, Ill.  
Waterman-Waterbury Co.,  
Minneapolis, Minn.  
Western Steel Products Co.,  
Duluth, Minn.  
Wise Furnace Co.,  
Akron, Ohio

## Gas Burning Attachments

Calkins & Pearce, Columbus, Ohio

## Grilles

Auer Register Co., Cleveland, Ohio  
Harrington & King Perforating Co.,  
Chicago, Ill.  
Hart & Cooley Co., New Britain, Conn.  
Independent Register & Mfg. Co.,  
Cleveland  
Tuttle & Bailey Mfg. Co., Chicago, Ill.  
U. S. Register Co., Battle Creek, Mich.

## Guards—Machine and Belt

Harrington & King Perforating Co.,  
Chicago, Ill.

## Handles—Boiler

Berger Bros. Co., Philadelphia, Pa.

## Handles—Soldering Iron

Hyo Mfg. Co., New York, N. Y.

## Handles—Furnace Door

Fanner Mfg. Co., Cleveland, Ohio

## Hangers—Eaves Trough

Apex Gutter Hanger Corp.,  
New York, N. Y.  
Berger Bros. Co., Philadelphia, Pa.  
Chase Brass & Copper Co.,  
Waterbury, Conn.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Heat Regulation Systems

Minneapolis-Honeywell Regulator  
Co., Minneapolis, Minn.  
Noll Regulator Co., Youngstown, Ohio  
Sheer Co., H. M., Quincy, Ill.  
White Mfg. Co., Minneapolis, Minn.

## Heaters—Cabinet

Fox Furnace Co., Elyria, Ohio  
Mt. Vernon Furnace & Mfg. Co.,  
Mt. Vernon, Ill.  
Motor Wheel Corp., Heater Division,  
Lansing, Mich.  
Waterman-Waterbury Co.,  
Minneapolis, Minn.

## Heaters—School Room

Meyer Furnace Co., The, Peoria, Ill.  
Western Steel Products Co.,  
Duluth, Minn.  
Waterman-Waterbury Co.,  
Minneapolis, Minn.

## Humidifiers

Automatic Humidifier Co.,  
Oscar, Falls, Iowa  
Diener Mfg. Co., G. W., Chicago, Ill.  
Meyer & Bro. Co., F., Peoria, Ill.  
Sheer Co., H. M., Quincy, Ill.  
Sallada Mfg. Co., Minneapolis, Minn.

## Lath—Expanding Metal

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Machines—Crimping

Bertsch & Co., Cambridge City, Ind.  
Yoder Co., The, Cleveland, O.

## Machinery—Culvert

Bertsch & Co., Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.

## Machinery—Rebuild

Interstate Machinery Co., Chicago

## Machines—TinSmith's

Bertsch & Co., Cambridge City, Ind.  
Drele & Krump Mfg. Co., Chicago, Ill.  
Hyo Mfg. Co., New York, N. Y.  
Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co.,  
Marshalltown, Iowa  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
The Stanley Electric Tool Co.,  
New Britain, Conn.  
Whitney Mfg. Co., W. A.,  
Rockford, Ill.  
Yoder Co., The, Cleveland, O.

## Metals—Perforated

Harrington & King Perforating Co.,  
Chicago, Ill.

## Miters—Eaves Trough

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Braden Mfg. Co., Terre Haute, Ind.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

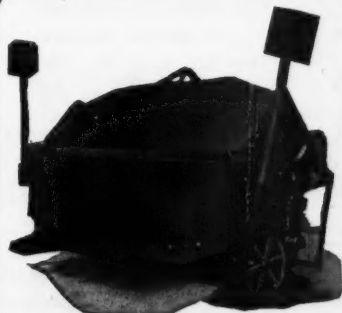
## Nails—Copper and Brass

Chase Brass & Copper Co.,  
Waterbury, Conn.

(Continued on page 54)

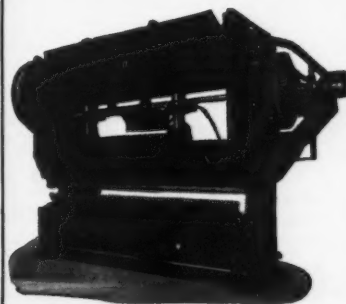
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Plumbers Putty

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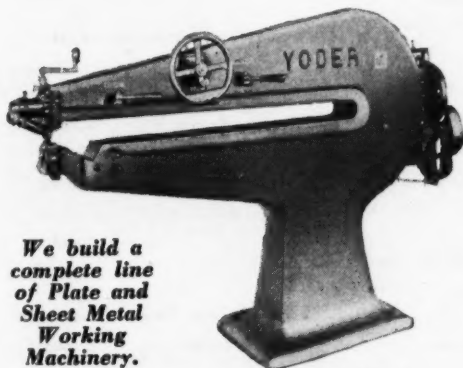
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(Patent Applied For)

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This shear, with 60" gap to accommodate large sheets, will cut any weight of sheet metal up to 14 gauge. It can be used for short curves in any direction and will cut circles without running in from the side of material. This machine has two speeds controlled by hand lever and is equipped with a Yoder friction clutch. Write for further information.

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PLATE AND SHEET METAL MACHINERY SPECIALISTS

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# BUYERS' DIRECTORY

(Continued from page 52)

**Nails—Hardened Masonry**

Parker-Kalon Corp., New York, N. Y.

**Oil Burners**

Berryman System of Oil Heating, Inc., Chicago, Ill.  
 Bettendorf Mfg. Co., Bettendorf, Iowa  
 Rock Oil Burner Co., Madison, Wis.  
 Mellvaine Burner Corp., Evanston, Ill.  
 Silent Automatic Corp., Detroit, Mich.

**Paint**

Connors Paint Mfg. Co., Wm., Troy, N. Y.

**Patterns—Boat**

Thompson Boat &amp; Pattern Co., Decorah, Iowa

**Perforated Metals**

Harrington &amp; King Perforating Co., Chicago, Ill.

**Pipe and Fittings—Furnace**

Henry Furnace & Fdy. Co., Cleveland, Ohio  
 Meyer & Bro. Co., F., Peoria, Ill.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Osborn Co., The J. M. & L. A., Cleveland, Ohio  
 Peerless Foundry Co., Indianapolis, Ind.

**Pipe and Fittings—Stove**

Meyer & Bro. Co., F., Peoria, Ill.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Pipe—Conductor**

Barjes Metal Products Co., Chicago, Ill.  
 Berger Bros. Co., Philadelphia, Pa.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Pipe—Spiral**

Chicago Metal Mfg. Co., Chicago, Ill.

**Punches**

Bertsch & Co., Cambridge City, Ind.  
 Hyro Mfg. Co., New York  
 Interstate Machinery Co., Chicago, Ill.  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
 W. A. Whitney Mfg. Co., Rockford, Ill.

**Punches—Combination Bench and Hand**

Hyro Mfg. Co., New York, N. Y.

**Punches—Hand**

Hyro Mfg. Co., New York, N. Y.  
 W. A. Whitney Mfg. Co., Rockford, Ill.

**Putty—Stove**

Connors Paint Mfg. Co., Wm., Troy, N. Y.

**Radiator Cabinets**

Hart &amp; Cooley Co., Holland, Mich.

**Ranges—Gas**

The Beckwith Co., Dowagiac, Mich.  
 Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

**Registers—Warm Air**

Auer Register Co., Cleveland, Ohio  
 Forest City-Walworth Run Foundries Co., Cleveland, Ohio  
 General Products Corp., Indianapolis, Ind.  
 Hart & Cooley Co., Holland, Mich.  
 Henry Furnace & Fdy. Co., Cleveland, Ohio  
 Independent Register & Mfg. Co., Cleveland, Ohio  
 Meyer & Bro. Co., F., Peoria, Ill.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Rock Island Register Co., Rock Island, Ill.  
 Symonds Register Co., St. Louis, Mo.  
 Tuttle & Bailey Mfg. Co., Chicago, Ill.  
 United States Register Co., Battle Creek, Mich.

**Register Shields**

General Products Corp., Indianapolis, Ind.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Registers—Wood**

American Wood Register Co., Plymouth, Ind.  
 Auer Register Co., Cleveland, Ohio  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Regulators—Heat**

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
 Modern Heat Regulator Co., Cleveland, Ohio  
 H. M. Sheer Co., Quincy, Ill.  
 White Mfg. Co., Minneapolis, Minn.

**Ridging**

American Rolling Mill Co., Middletown, Ohio  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Rivets—Stove**

Lamson & Sessions Co., Cleveland, Ohio  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Rods—Stove**

Lamson &amp; Sessions Co., Cleveland, Ohio

**Rolls—Forming**

Bertsch & Co., Cambridge City, Ind.  
 Interstate Machinery Co., Chicago, Ill.

**Roofing Cement**

Connors Paint Mfg. Co., Wm., Troy, N. Y.  
 Lastik Products Corp., Pittsburgh, Pa.

**Roof Paints**

Lastik Products Corp., Pittsburgh, Pa.

**Roof—Flashing**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Roofing—Iron and Steel**

American Rolling Mill Co., Middletown, Ohio  
 Republic Steel Corp., Youngstown, Ohio  
 Inland Steel Co., Chicago, Ill.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Osborn Co., The J. M. & L. A., Cleveland, Ohio  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Roofing—Tin**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Taylor Co., N. & G., Philadelphia, Pa.

**Rubbish Burners**

Hart &amp; Cooley Co., Holland, Michigan

**Schools—Sheet Metal Pattern Drafting**

St. Louis Technical Institute, St. Louis, Mo.

**Schools—Warm Air Heating**

St. Louis Technical Institute, St. Louis, Mo.

**Screws—Hardened Metallic Drive**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Parker-Kalon Corp., 200 Varick St., New York

**Screws—Hardened Self-Tapping, Sheet Metal**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Parker-Kalon Corp., 200 Varick St., New York

**Screens—Perforated Metal**

Harrington &amp; King Perforating Co., Chicago, Ill.

**Scuppers**

Aeolus Dickinson, Chicago, Ill.

**Shears—Hand and Power**

Interstate Machinery Co., Chicago, Ill.  
 Marshalltown Mfg. Co., Marshalltown, Ia.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
 The Stanley Electric Tool Co., New Britain, Conn.  
 Viking Shear Co., Erie, Pa.  
 Yoder Co., The, Cleveland, O.

**Sheet Metal Screws—Hardened, Self-Tapping**

Parker-Kalon Corp., 200 Varick St., New York

**Sheets—Alloy**

International Nickel Co., New York, N. Y.  
 Republic Steel Corp., Youngstown, Ohio

**Sheets—Black and Galvanized**

Inland Steel Co., Chicago, Ill.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Osborn Co., The J. M. & L. A., Cleveland, Ohio  
 Republic Steel Corp., Youngstown, Ohio  
 Rockford Sheet Steel Co., Rockford, Ill.  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
 Taylor Co., N. & G., Philadelphia, Pa.

**Sheets—Iron**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Republic Steel Corp., Youngstown, Ohio  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Sheets—Tin**

Taylor Co., N. &amp; G., Philadelphia, Pa.

**Shingles and Tiles—Metal**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Sifters—Ash**

Diener Mfg. Co., G. W., Chicago, Ill.

**Sky Lights**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Snips**

Ryerson &amp; Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Solder—Acid Core**

Kester Solder Co., Chicago, Ill.

**Solder—Self-Fluxing**

Kester Solder Co., Chicago, Ill.

**Solder—Rosin Core**

Kester Solder Co., Chicago, Ill.

**Solder**

Kester Solder Co., Chicago, Ill.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Soldering Furnaces**

Diener Mfg. Co., G. W., Chicago, Ill.  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Specialties—Hardware**

Diener Mfg. Co., G. W., Chicago, Ill.

**Stars—Hard Iron Cleaning**

Fanner Mfg. Co., Cleveland, Ohio

**Tinplate**

Milcor Steel Co., Canton, Chgo., La Crosse, K. C.  
 Osborn Co., The J. M. & L. A., Cleveland, Ohio  
 Taylor Co., N. & G., Philadelphia, Pa.

**Tools—TinSmith's**

Bertsch & Co., Cambridge City, Ind.  
 Dries & Krump Mfg. Co., Chicago, Ill.  
 Hyro Mfg. Co., New York, N. Y.  
 Interstate Machinery Co., Chicago, Ill.  
 Osborn Co., The J. M. & L. A., Cleveland, Ohio  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Rockford Sheet Steel Co., Rockford, Ill.  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
 The Stanley Electric Tool Co., New Britain, Conn.  
 Viking Shear Co., Erie, Pa.  
 Whitney Mfg. Co., W. A., Rockford, Ill.

**Torches**

Diener Mfg. Co., G. W., Chicago, Ill.  
 Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Trade Extension**

Copper & Brass Research Association  
 National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio

**Trimmings—Stove and Furnace**

Fanner Mfg. Co., Cleveland, Ohio

**Vacuum Cleaner—Furnace**

Brillion Furnace Co., Brillion, Wis.  
 National Super Service Co., Toledo, Ohio

**Ventilators—Floor**

Aeolus Dickinson, Chicago, Ill.

**Ventilators—Roof**

Aeolus Dickinson, Chicago, Ill.  
 Berger Bros. Co., Philadelphia, Pa.  
 Paul R. Jordan & Co., Indianapolis, Ind.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

**Ventilators—Ceiling**

Hart & Cooley Co., New Britain, Conn.  
 Henry Furnace & Fdy. Co., Cleveland, Ohio

**Wood Faces—Warm Air**

Auer Register Co., Cleveland, Ohio  
 American Wood Register Co., Plymouth, Ind.  
 Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Mention AMERICAN ARTISAN in your reply—Thank you!



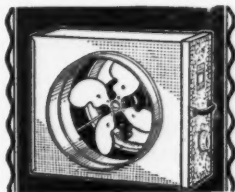
## GREATER SATISFACTION To the User—with a Profit to You

Install **A-C Thermostatically Controlled Heat Boosters**, the unit that makes every installation a better one. The A-C Booster will make furnace selling easier.

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Thermostatically  
Controlled  
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**HEAT BOOSTER**

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leading cities

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## REX Gas FIRED Furnaces

The Rex with its tubular construction has more than twice the amount of radiation than many other furnaces. They are designed to burn gas economically and efficiently. The white arrows show the long fire travel to flue.

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No. 290  
Gas Furnace



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The dealer who has never sold Torrid Zone steel furnaces has no conception of the many advantages this furnace line offers. To say you are familiar with Torrid Zone construction is not enough. There are, free engineering service, newspaper and dealer help advertising, financial aid, an unusual va-

riety of furnace sizes, quick deliveries made possible by large warehouse stocks, and a score of other Torrid Zone service features of vital interest to every furnace dealer. Why not investigate for yourself Torrid Zone possibilities. Write for complete information on the Torrid Zone line.

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283 Clinton Street Milwaukee, Wis.

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REG. U.S. PAT. OFF. PIPE OR PIPELESS

The Waterman-Waterbury Co.  
1122 Jackson Street N. E.  
Minneapolis, Minn.

Mention AMERICAN ARTISAN in your reply—Thank you!

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# Classified Advertising

## BUSINESS CHANCES

**Lightning Rods**—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddle Company, Marshfield, Wis.

Guaranteed Mailing Lists for the Furnace and Accessory Manufacturer and Jobber. For any state or all of them. H-533

**Terry Whalen & Associates**  
Bloomington, Ill. (Box 180)

**For Sale**—Good river bottom farm of 80 acres. \$6,000 worth of improvements. Will sell for \$10,000 or will exchange for stock of hardware or furniture up to \$6,000. Railroad within two miles. Good schools and churches near. Good roads. For information, write L. F. Sutterer, Perryville Hardware Company, Perryville, Missouri. Y-532

**For Sale**—Plumbing and heating business. Full set of tools for each line. \$600.00 if taken in the next thirty thirty days. Address John L. Bloyd, Bement, Illinois. F-533

How to kill muriatic acid fumes, when used for soldering flux, we have used it for three years, and like it, especially for heavy soldering. Cheap and easy prepared. Formula, \$1.00 post paid. Address Floydada Tin Shop, 311 South Main Street, Floydada, Texas. G-533

**For Rent**—A one story building; brick and concrete; floor space 98x54; suitable for small factory; has been shoe factory. Good shipping point at the Depot. Town of 700. Address J. J. Martin, Chamois, Missouri. B-533

**For Sale**—Complete outfit, machinery, tools and stock, for sheet metal and furnace shop. For information call or write Anderson Furnace Company, 4530 North Troy Street, Chicago, Illinois—Telephone Juniper 2133. M-534

**For Sale**—Sheet Metal works, well equipped and twenty years on the same place. Reasonable rent, good business for right party. Selling on account of ill health. Address R-534, AMERICAN ARTISAN, 139 North Clark St., Chicago, Illinois.

**For Sale**—Good clean stock of hardware, and tin shop and warehouse room. Stock invoices \$15,000. Sickness reason for selling. Address K-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

**For Sale**—Sheet Metal and Warm Air Heating business in a southern Illinois town of 30,000. Established ten years. Average yearly business, \$15,000 to \$20,000. Wish to sell building, stock and equipment. War service disability forcing retirement. Large display room and office space, located in heart of city. Address L-534, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

## HELP WANTED

Representative calling on the Warm Air Heating trade. Exclusive territory allotted. Commission basis. Address Star-Go Corporation, 2548 N. 18th St., Milwaukee, Wis. S-533

## HELP WANTED

**Wanted**—A tinner who is capable of taking full charge of a good shop and run it on a percentage basis. Must furnish good references. Prefer a man who might be interested in buying the shop later on. Address K-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

**Wanted**—A combination man who can do plumbing and sheet metal work, and who is willing to go out and estimate work. A real opportunity for party who wants to advance. Address Independent Supply Co., Inc., West Frankfort, Illinois. G-534

**Wanted**—One solicitor and estimator and one experienced working foreman, for a shop doing ventilating, blow pipe, skylight and cornice and general sheet metal work. Only first class men need apply. Address S-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

**Wanted**—Shop foreman that can do metal work, furnace work, roofing and everything that comes in a general shop. No plumbing. Steady work. Address H-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Furnace—Boiler—Plumber combination man** with Wisconsin license. A real business man, sober and industrious. One who can invest \$2000 or more in a large successful company. Write full details in first letter. Address John Steffel, Manager, 2101 Eastwood Place, Milwaukee, Wisconsin. A-534

**Experienced Stove and Furnace salesmen** for all states. Have very attractive straight commission proposition. Address The Peninsular Stove Company, Detroit, Michigan. F-534

**Wanted**—Heating Engineer to take complete charge of Heating Department. Must understand Domestic and Industrial forced-air heating. Address W-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

**Wanted**—Would like to hear from a good experienced tinner, plumbing and heating man who would like to get into business with little money. I have a good shop in a Minnesota town of 3,000, no competition. Have too much work and wish to get a good working partner. Address O-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

## Manufacturers' Agents

**Wanted to sell our furnace cement, roofing paint and cement and calking compounds.** Our consistent trade paper advertising is creating demand. Exclusive territory given with liberal commission. Address X-533, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Illinois.

## SITUATION WANTED

**Situation Wanted**—Reliable experienced heating man and salesman, twenty years experience, wants connection with furnace manufacturers, cast or steel furnaces. Work with dealers on sales and layouts for modern installation with or without modern equipment. Address X-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

**Situation Wanted**—First class licensed plumber, sheet metal worker and heating man, steady, sober, and competent in all branches of the trade, would like steady position; or will take shop on commission. Address Arthur Greeter, Lake Geneva, Wisconsin. Z-532

## SITUATION WANTED

### ENGINEERS

23 years experience in warm air heating. Worked up in 13 years from installer's helper through shop, office, estimating, drafting, trouble-shooting to retail sales and management. Past 10 years, engineering work with supervision of retail and wholesale sales. Age 43, married, good health, good habits. Sixteen years with present firm. Member A.S.H.V.E., associate member A.S.M.E. Will consider position with reputable manufacturer of fans or furnaces, or with progressive heating contractor specializing in high grade gravity and fan heating.

Address P-533, AMERICAN ARTISAN  
139 North Clark Street Chicago, Ill.

**Situation Wanted**—I am an all around sheet metal worker, and would like to hear from somebody who is going to need a working foreman or a bench man about April 1st. Address Mechanic, 417 Jones Street, Clearwater, Florida. Y-533

**Situation Wanted**—Modern Warm Air Heating Expert can qualify for any position with large heating firm. Expert in building trade and as high class factory representative. Address O-530, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By sheet metal worker and furnace man with 18 years experience in all lines. Can lay slate, cut patterns, lay out furnace job standard code and forced air. Have had factory maintenance experience. Will go anywhere. Married, sober, reliable in every way. Please state wages. Address Z-533, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

**Situation Wanted**—By licensed plumber, sheet metal worker, and heating man. Married, thoroughly competent, sober and steady. Can take full charge of shop if desired. Wish steady employment. Address M. R. Trisler, 507 North East Street, Kewanee, Illinois. L-533

**Wanted to hear from any furnace or sheet metal manufacturers or jobbers who want a good salesman for northern Minnesota, Dakota and eastern Montana.** Have had the experience and can deliver the goods. Know this country from 35 years experience. Write me before closing territory. Address C-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By man thirty-five years of age, single, ten years experience in hot water, steam and warm air heating. Also sales managing and handling canvassers. Position wanted as salesman for a reliable furnace manufacturer or salesman and engineer for dealer. Address Geo. A. Whiteman, P. O. Box 112, Rochester, N. Y. G-531

**Situation Wanted**—Are you in need of a man who is thoroughly experienced in all lines of the sheet metal trade, making a specialty of warm air heating? Can estimate the work, lay out the plans, and make blueprints. Have had sales experience, and will look out for your interests. A good reliable worker. Address H-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

**Wanted**—Position as manager of warm air heating department with well rated firm. Nearly 15 years experience in residence, church and industrial heating. Advertising and sales promotion ability of high order. Know how to build a profitable repair department. Address O-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By all round sheet metal worker. Experienced in all branches of warm air heating work. Use the Standard Code. Would like steady position or will work on commission. Will go anywhere. Address E. M. True, R. No. 3, Box 810, Portland, Oregon. J-533

Mention AMERICAN ARTISAN in your reply—Thank you!



## SITUATION WANTED

Situation Wanted—By A-1 sheet metal worker and warm air heating man. 31 years old, steady and sober. Thoroughly experienced in blow-piping, ventilating and general sheet metal work. Can read blueprints, draw patterns and estimate if necessary. Can also do good job of plumbing. Good references. Will go anywhere. Address D-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—As salesmen and heating engineer. 15 years experience. Can do all drafting and estimating. Sober, hard worker. Can give best of references. Let's get together. Address T-533, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

Situation Wanted—Would like to talk with a manufacturer of coal and gas fired furnaces who believes that there is a great future for gas as a fuel. For twelve years I served a former well known manufacturer as salesman, in sales promotion, and as branch sales manager. Believe I can be of value in your executive sales department. Write in complete confidence to P-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By a first class sheet metal worker and furnace man. Good reliable man, steady and sober. Please state wages. Address T-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By a first class sheet metal worker and furnace man. Good reliable man, steady and sober. Middle aged and married. Would consider running shop on percentage basis. Address J-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By an all round man in tinning, plumbing and furnace work. Would like to locate in Wisconsin or Iowa. Can come at once. Address E-533, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

## MISCELLANEOUS

For Sale—A Gottschalk "Christie" Furnace Cleaner—like new. Only used on one job. Will sell at great sacrifice. Address Jos. Koubek & Son, 5234 West 22nd Street, Cicero, Illinois. A-533

## TOOLS AND MACHINES

### For Sale or Exchange

One 72" Box and Pan Brake, almost new, will handle 18 gauge material, weighs 1800 lbs. and is mounted on heavy casters. Price \$150.00.  
One 98" Chicago ALL STEEL BRAKE, complete equipment for 18 gauge material, used but in very good shape. Price \$125.00.  
One Marshalltown Shear with motor and will handle 18 gauge; been used some but in every good shape, weighs 130 lbs. Price \$80.00.  
One 18" Canedy-Otto Drill Press power feed, height over all 70", weighs 675 lbs. in good shape. Price \$90.00.  
One 14" Bench Band Saw complete with motor, condition good as new, weighs 200 lbs., Northfield make. Price \$75.00.  
One 42" Niagara foot power squaring shear with hold down attachment and two sets of blades, has been used but in good shape. Price \$60.00.  
One 30" Peck & Stow No. 2 squaring shear new and complete, including a 30" pipe folder attached to top; this in very good shape. Price \$70.00.  
One 125 Volt D.C. Generator, been used. Price \$50.00.

Address CHAS. BARNUM  
Mankato, Minn.

All subject to prior sale

E-534

For Sale—Two Stove Pipe Folders; one tin folder; one large buring machine; one small buring machine; one large thick edge; one small thick edge; two 30" square shears; roofing tongs; roofing double seamers; 30" rollers; three double seamers and other machines all in good working condition. Address P. W. Nicola, Leavenworth, Kansas. C-533

For Sale—Complete up-to-date sheet metal shop equipment for heating and ventilating and general sheet metal work. Power tools for 10 gauge and lighter. Will send list of all tools if interested. Willing to sell cheap for cash. Address Knapper Sheet Metal Co., 218 E. Walnut St., Kalamazoo, Mich. X-531

Wanted—The Peck, Stow & Wilcox Company No. 1734 improved foot gang punch, or its equal in some other make. Quote full particulars and best price in first letter. Address L-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

## TOOLS AND MACHINES

For Sale—One 8 foot power squaring shear, 18 gauge capacity. One Power Ridge Roll Machine in A-1 condition, will be sold cheap if taken at once. Address B-534, AMERICAN ARTISAN, 139 N. Clark St., Chicago.

For Sale—Complete line of tinners tools, including electric motors and drill press. For information call Beverly 6710, Chicago, or write Mend-All Repair & Manufacturing Company, 921 West 87th Street, Chicago, Illinois. D-533

Wanted—A four or six foot Box and pan brake, 16 gauge cap. Also 30" or 36" squaring shears. Address The Main Hardware & Supply Company, Painesville, Ohio. P-532

Wanted—A set of second hand tinners tools and machines. Must be in good condition and cheap for cash. Address Roy K. Davis, 722 West Second Street, Xenia, Ohio. L-531

For Sale—Type "T" 9 Summerheat Oil Burner, thermostat and Relay. Used two months. Best offer takes it. Address C. L. Epps, 229 North Washington St., Van Wert, Ohio. R-530

Wanted—A Double Seaming Machine for seaming bottoms. Kindly specify name, number and price in your first letter. Address Huettmann & Federspiel, 307 Franklin St., Port Washington, Wisconsin. O-533

For Sale—One 30" Danzer Lightning Edger, \$20.00; one 20" Groover, \$5.00. These tools are as good as new. If interested, Address Haftenkamp Heating Company, 2611 East 34th Street, Kansas City, Missouri. K-533

For Sale—One 10 gauge 50" Belt driven Power Rolls, \$225.00. One 10 gauge No. 10-M Marshalltown Rotary shears, motor attached, \$220.00. Rolls and Rotary shears as good as new. One Large Drill Press, motor attached made by the E. L. Essley Machinery Company, \$100.00. Drill Press is not new but in good shape. Address R-533, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Wanted—A 10 foot brake for light iron. Address 20th Avenue Sheet Metal Works, 2141-43 Court Place, Denver, Colorado. J-532

# Rummel Sells a \$700 Replacement Job

(Continued from page 32)

way, connected through the mercoid control to a forced draft blower which blows directly into the ashpit of the furnace. It has an automatic draft adjuster on the smoke pipe which opens as the draft increases, holding the heat in the furnace.

The automatic controls work as follows—the Mercoid control is set at 175 deg. low and 275 deg. high. When the room thermostat calls for heat, the blower starts, raising the temperature of the furnace to 275 degrees, the Mercoid control turns over, shutting off the current to the forced draft and turning on the

fans which run until the heat is lowered to 175 degrees when they shut off and the forced draft again starts. This is repeated until the room thermostat is satisfied. The temperature in the house never varies over a couple of degrees, every room in the house is heated evenly and there had to be only a slight adjustment of the dampers in the basement.

There are one or two other points worth attention. The system is completely painted with enamel and any home owner can have whatever color of enamel he desires. This particular job was painted a light and attractive shade of green.

Also with this system using the forced draft blower the owner now burns \$5.00 a ton slack as against \$10.00 a ton lump previously. This accounts in a large measure for the reduction in fuel costs. However, with the constant control by the electric equipment, this slack can be burned without any attention and provides a hot, even heat.

The new registers are of the baseboard type throughout the second floor while the old registers are of the floor type. All the new return air grilles on the second floor are baseboard. On the first floor both floor and baseboard warm and return grilles are used.

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# HINES

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# WHEN A PRODUCT INSPIRES SUCH WORDS AS THESE . . . . .

"For the greater part of the twenty-seven years we have been in business in Dixon, we have used HANDY furnace pipe and fittings.

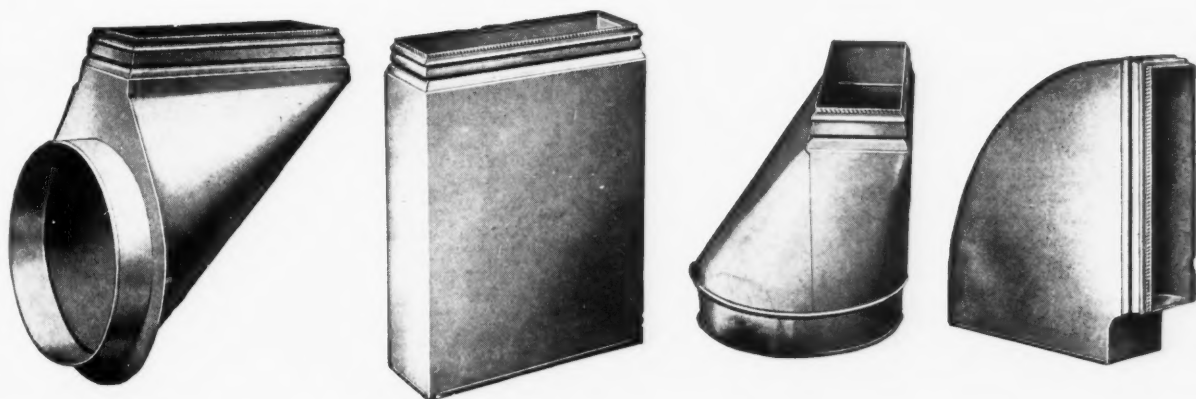
"At various times we have been inveigled into trying some other make of pipe, but we have always returned to HANDY."

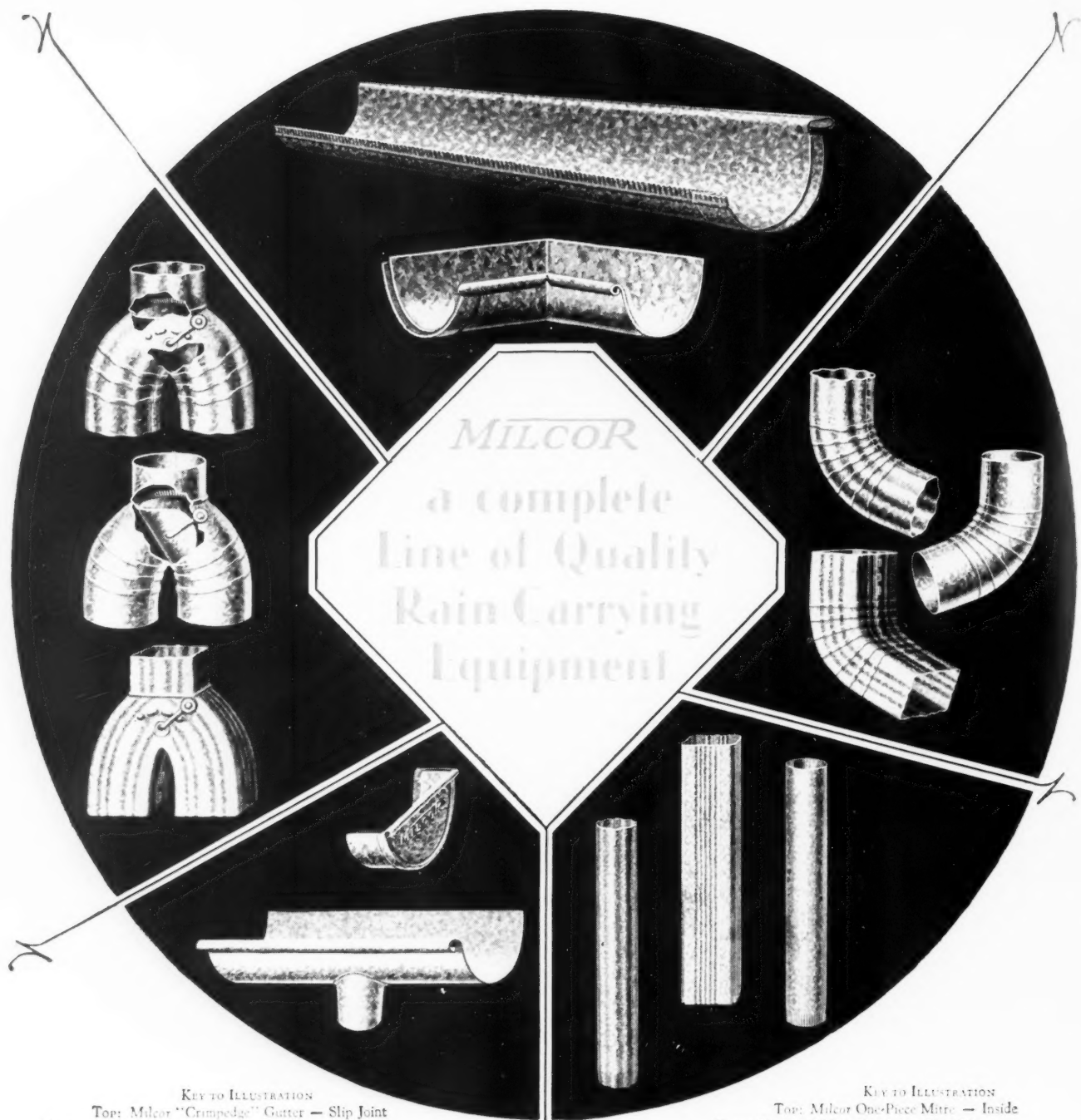
*(Name on request).*

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F. MEYER & BRO. CO., PEORIA, ILL.





KEY TO ILLUSTRATION  
 Top: Milcor "Crimpedge" Gutter — Slip Joint  
 Upper Left: Kuehn's Korrokt Kut-Offs  
 Lower Left: Milcor End and Drops

KEY TO ILLUSTRATION  
 Top: Milcor One-Piece Mitre — Inside  
 Upper Right: Milcor Conductor Pipe Elbows  
 Lower Right: Milcor "Interlock" Conductor Pipe

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